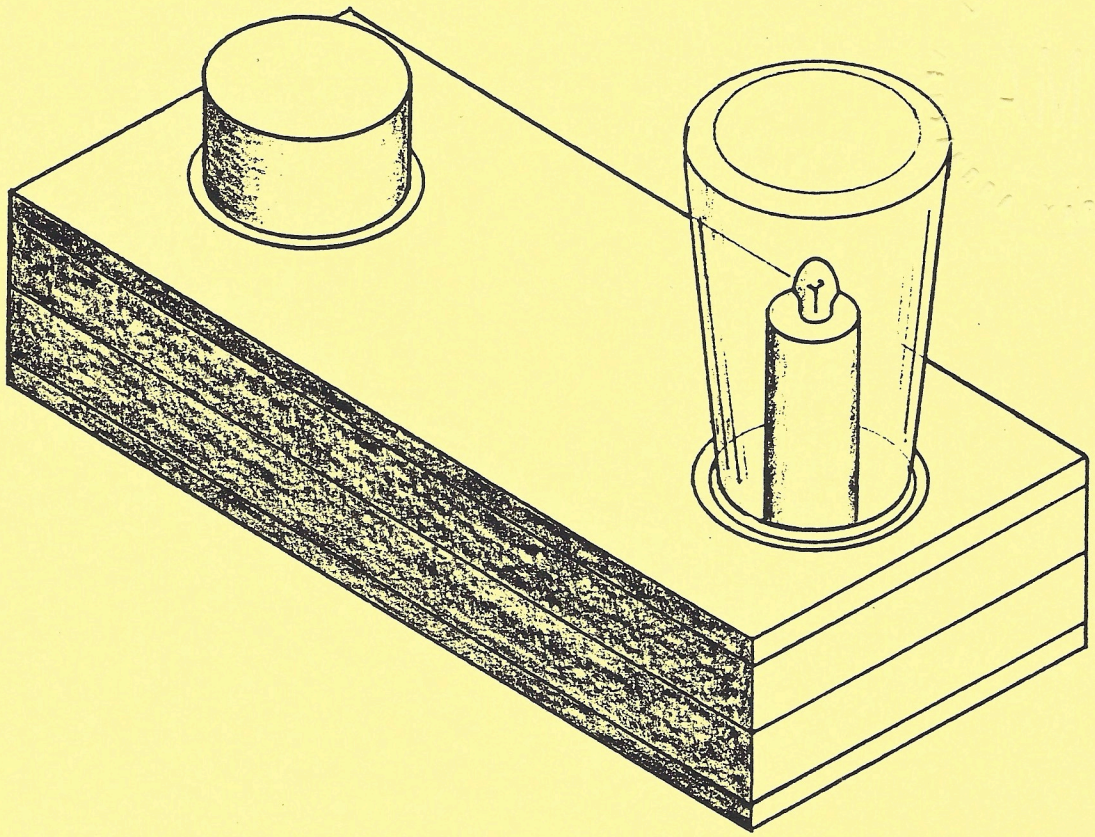
LEKOTEK PLAN BOOK of ADAPTIVE TOYS VOLUME I



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lekotek

ABOUT THE NATIONAL LEKOTEK CENTER

Lekotek is a system of support and information for families of children who have a disability or special need. In monthly play sessions specially trained Lekotek Leaders provide play modeling for families of children with disabilities and special needs. This enables the child to become more active in his family and the family more a part of the mainstream of society. Lekotek centers often offer other services to families in addition to the play sessions, including newsletters, educational workshops and social events, a ~~mainstreaming~~ an inclusion program for preschoolers with disabilities or special needs, and the home loan of toys.

There are currently ~~54~~ 51 Lekotek sites in 19 states, serving 3,500 families. 24 Compuplay sites

The National Lekotek Center is located in the Evanston Civic Center at 2100 Ridge Avenue, Evanston, Illinois, ~~60204~~. 60201

~~INNOTEK~~ COMPUPLAY is the technology division of the National Lekotek Center. It provides technology related resources and training to children with disabilities and special needs, their families, and the professionals who work with them throughout the United States.

INNOTEK provides multi-dimensional technology resources. These services include graduate level technology training courses and consultation services for school districts, therapy centers, parent groups, and recreation programs.

INNOTEK also oversees the network of Compuplay Resource Centers throughout the US. These centers offer computer play classes, drop-in centers, and software lending libraries to families with children with disabilities and special needs. Compuplay centers also provide in-service programs to teachers and therapists at the local level.

More information about the programs and services of Lekotek and INNOTEK can be obtained by calling the National Lekotek Center at (708) 328-0001.

800/366-PLAY

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This toy plan book was produced through the efforts of Carl Gulbrandsen and William Grogg, Jr., both retired engineers who work with the National Lekotek Center. Special thanks to the many Lekotek Leaders who contributed their time and experience to make this book possible including the editors, Linda Schwartz, Raquel Reyes, and Rachel Reese. Layout and design were by Miriam S. Harris. The drafting was done by V. J. Jozaitis.

The mission of Lekotek is to assist in the integration of children with disabilities into the mainstream of society. This is done by helping families create a home atmosphere in which they can best nurture their children. Because children learn about their world through play, all Lekoteks have an extensive toy library for home loan.

It can be very difficult to find toys that truly meet the needs of children with severe physical or mental handicaps. Without certain tailored adaptations, many children could not experience the joy of playing with toys. It was for this reason Lekotek became interested in adapting toys for children with special needs.

This interest led to the first adapted toy plan book which was developed through a grant from The Quaker Oats Company. This book is one in a series of three which contain plans from Lekotek centers throughout the United States. Lekotek remains grateful for the continued support of The Quaker Oats Company in producing this series of books.

All the toys in this edition have been tested and used in Lekotek centers. Although the toys may have been developed to address the development of children who are physically or mentally limited in their abilities, it is the play value that is always the first consideration.

But, are the toys in this book only fun for children with special needs? Delightfully, no! It is through play that we can truly see that children are more alike than different. These toys will touch the joy in **all** children.

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As you read this book, keep in mind the importance of multi-sensory stimulation. Achieving a balance of visual, auditory and tactile stimulation for the child with disabilities is an important consideration. In creating toys from these plans keep in mind the following suggestions for sensory stimulation.

VISUAL

It is recommended that colors used to paint the toys be bright and clear shades of red, blue, green and yellow. While the use of bright colors and two-color patterns can actually reinforce learning, **excessive** use of bright colors or painted patterns on toys may be overstimulating. When painting a toy, care should be taken to keep color variety to a minimum. A neutral background for the basic toy with auxiliary parts painted in one or more of the basic primary colors, is recommended.

For many wooden toys, an application of a light coat of varnish is sufficient. This will provide a neutral background for any brightly colored parts. This coat of varnish will also aid in easy clean up.

AUDITORY

Some children may startle or become frightened by loud bursts of sound. It is recommended that toys which are auditorily stimulating contain tonal qualities which are soft and melodic. Loud buzzers are not generally recommended.

TACTILE

For toys which provide tactile stimulation, we recommend keeping each different component a markedly separate texture from the others. This serves to facilitate the child's ability to differentiate between them. In order that the tactile component of the toy be fully perceived by the child, it is recommended that the background consist of neutral or dark solid colors. When designing a toy remember that a child's hands are small and grip toys must be proportioned to their size.

PAINT SAFETY

In 1977, the U.S. Consumer Product Safety Commission published an act that regulates, in the public interest, the use of lead-containing paint. This act bans the use of lead-containing paint on toys and other articles intended for use by children. The act requires that lead-containing paints bear on their labels the statement, "Do not apply on toys and other children's articles, furniture, or interior surfaces which may be occupied or used by children." **When buying paint for children's toys or furniture, carefully read the label for the assurance that the paint does not contain lead.**

A NOTE ABOUT THE USE OF THIS PLAN BOOK

Some of the toys in the plan books have specific material lists that call for electrical or electronic components for assembly.

The source of some of these items has frequently been a surplus merchandise dealer who specializes in odd lots, overruns and/or obsolete items. Some are new; some are used. Usually they are priced well below the original cost of the item.

The problem that has surfaced is that a certain item, after a year or more, may no longer be available from the source used at the time of the publication of the plan book. Anyone using the plan book should consider the instructions as a guide and not as a specific direction in building a particular Lekotek toy. With similar components, any person with a capacity to build these toys should be able to use substitute components from other sources and adjust dimensions accordingly. The results should be an equally enjoyable toy.

Most toy makers find it as easy to make several of the same toy as to just make one. Cut enough pieces for multiple toys at the same time. But it is a good idea to then assemble one complete toy first so that any corrections in the cuts can be made before you proceed to assemble the rest of the toys. You will just be multiplying the fun for some very lucky children!

All of the toys in this book with flat bases will benefit from the application of non-skid material or rubber pads to the bases. This will help keep the toy within reach and stable for the child with developing coordination. A good material to use is the lightest weight carpet padding sold commercially to keep small area rugs from slipping around on the floor. Often, a friendly carpet dealer will provide a toy maker with left over scraps at minimal (or no) cost. These can be easily cut to fit the base of the toy.

Play has been defined as "positive active engagement" and as "pleasurable, enjoyable, and positively valued." If you go to the experts, however, children will define play in one word...fun. Until recently, the role of play in child development was not taken seriously or was even seen as an obstacle to learning.

The special characteristics of play are in its positive foundations and opportunities to interact with the environment, including the people and objects which surround a child. Play is also unique in that it is spontaneous and freely chosen.

Play has been shown to be related to other qualities, such as creativity, problem solving, language, and social/emotional development. Visual, auditory and tactile stimuli which automatically result from simple toy interactions act as reinforcers and maintain the toy play behavior (Murphy, et al., 1986).

For children with disabilities, conventional and commercial toys and commercial educational materials alone may not be appropriate. Physical, cognitive and sensory impairments may prevent the children from operating and learning from these materials (Hanline et al., 1985). Adapted toys can address this problem. A child needs to react and interact in the relaxed manner that is characteristic of play. Successful play can often be reliant on the reactions of the person who plays with the child. Helping the child achieve a feeling of success is vital to that child's development of a positive self concept. A child may only need to touch a toy or art project in order to feel directly responsible for the finished product (Lindquist, 1977).

Adapted toys create a situation in which the child can have control. This can be an imaginary setting or a practical life situation. The important factor is that the control rest with the child. Coker (1984) states that as interest has increased in the earlier intervention of infants and toddlers with disabilities, so has the need for the development of materials to meet the needs of this younger population.

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VIDEOTAPES VHS only (V#'s for sales and R#'s for rental) Two-week rental requires a $25.00 deposit by separate check. Postage and handling charge: $3.50 for 1; $5.00 for 2; $8.00 for 3 or more.

INTRODUCTION TO LEKOTEK A beautiful 8-minute video about Lekotek, including scenes of Lekotek play sessions, computer sessions and comments from parents.
V100.....$50.00 R100.....1 for $15.00 and 2 for $25.00

TOY MAKING: CREATING FUN FOR THE CHILD WITH SPECIAL NEEDS A 12-minute video targeted to audiences whom you would like to interest in making toys for your special kids. Not strictly a "how-to" but shows how easy it is to get involved.
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FRIENDS An 8-minute video featuring the Preschool Mainstreaming Project at the National Lekotek Center. It demonstrates the value of placing children who have disabilities or special needs into regular preschool settings.
V200.....$50.00 R200.....1 for $15.00 and 2 for $25.00

PUBLICATIONS

LEKOTEK PLAY GUIDE FOR CHILDREN WITH SPECIAL NEEDS A discussion of toys and play for the parents of children who have disabilities. Postage and handling by weight and distance. P450.....$3.75 each

VOLUMES I, II and III of the LEKOTEK PLAN BOOK OF ADAPTIVE TOYS Detailed plans and drawings for making switches, toy adaptations & wooden toys for children, especially those with handicaps. P600, P650 and P675

$6.00 each book
$15.00 for all 3 } includes postage-handling

$15.00 for 1 volume
$25.00 for 2 volumes
$12.50 each for 3 - 9 volumes
$11.25 each for 10 or more

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Postage and handling charges:
$1.00 to $10.00.....$1.50
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$17.01 to $30.00.....3.00
$30.01 to $60.00.....4.00

INNOTEK SOFTWARE RESOURCE GUIDE 1990 A guide for the selection of computer software and hardware appropriate for children with special needs, ages 2 -14 yrs.
P850.....$20.00 plus $3.50 for postage and handling

Prices are subject to change without notice. 1/18/90

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for the special price of

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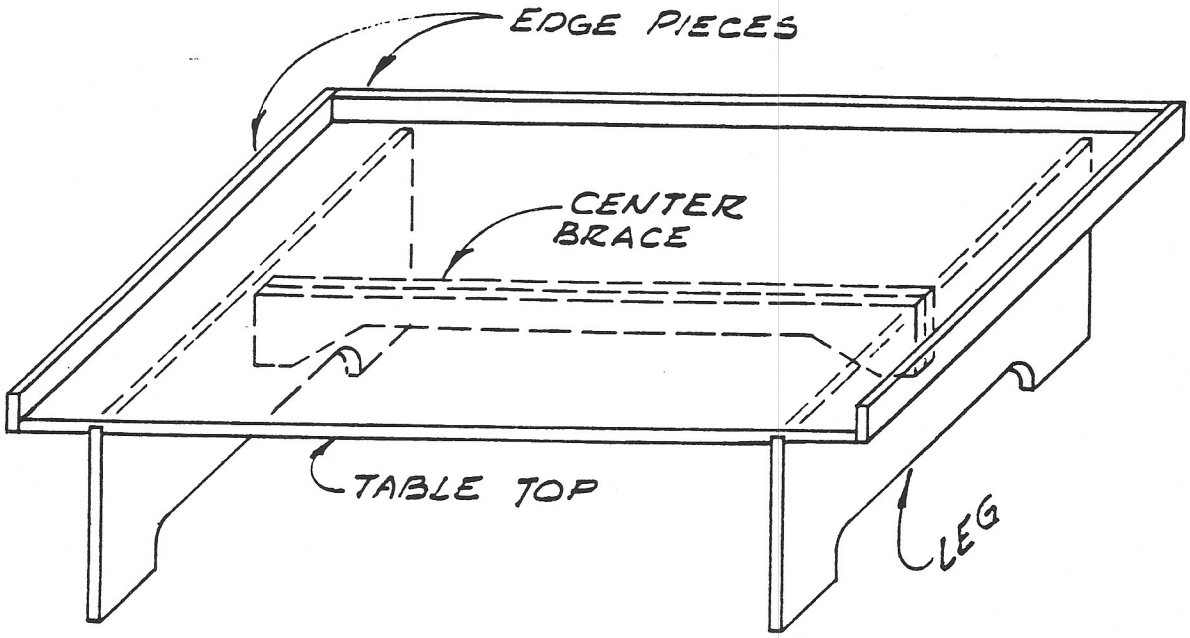
a savings of $7.50!

PREPAYMENT TO THE NATIONAL LEKOTEK CENTER IS REQUIRED.

No.	Quantity	Item	Size	Cost Each	Total

FLOOR TABLES

These are small 23-7/8" x 12" tables of varying heights and light weight. The single small underside brace permits a child to put legs and feet underneath while seated on the floor. The material is 3/8" plywood. The tables are glued and nailed together, then finished with three coats of Varathane varnish. A cutting scheme for making six tables of varying heights is on the next page.



FLOOR TABLE ASSEMBLY

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FLOOR TABLES

Materials needed for one table of each height:

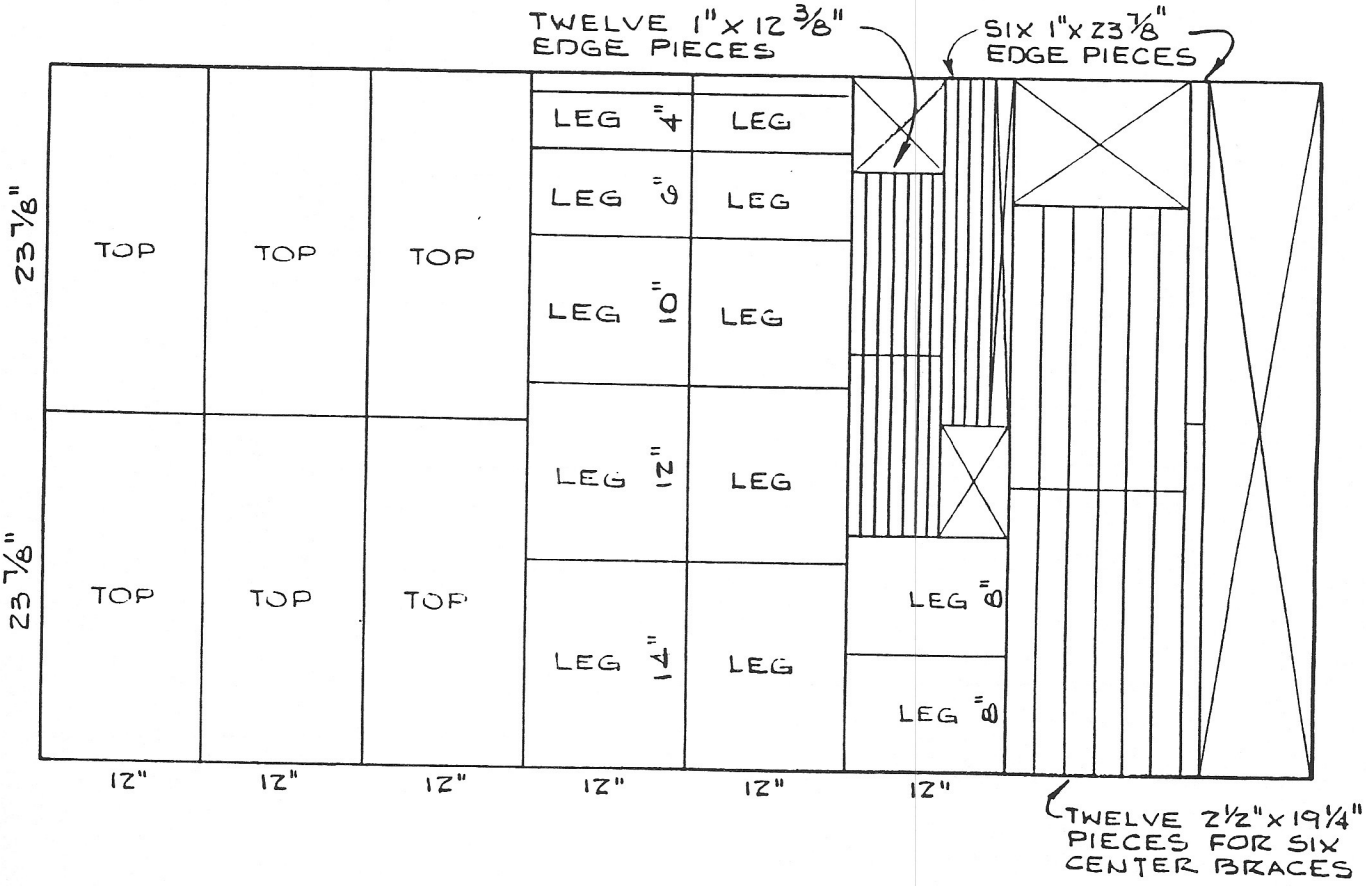
- One 4' x 8' x 3/8" sheet of birch plywood, cut to sizes shown on cutting scheme drawing
- Elmer's Carpenter Glue
- 1" x #17 wire brads
- Varathane gloss varnish

Tools needed:

- Table saw
- Sander
- Fine sandpaper
- Hammer
- Ruler
- Square
- Brush

FLOOR TABLES

This is the scheme for cutting six varied height floor tables from one 4' x 8' x 3/8" sheet of birch plywood. Details are on the following page.



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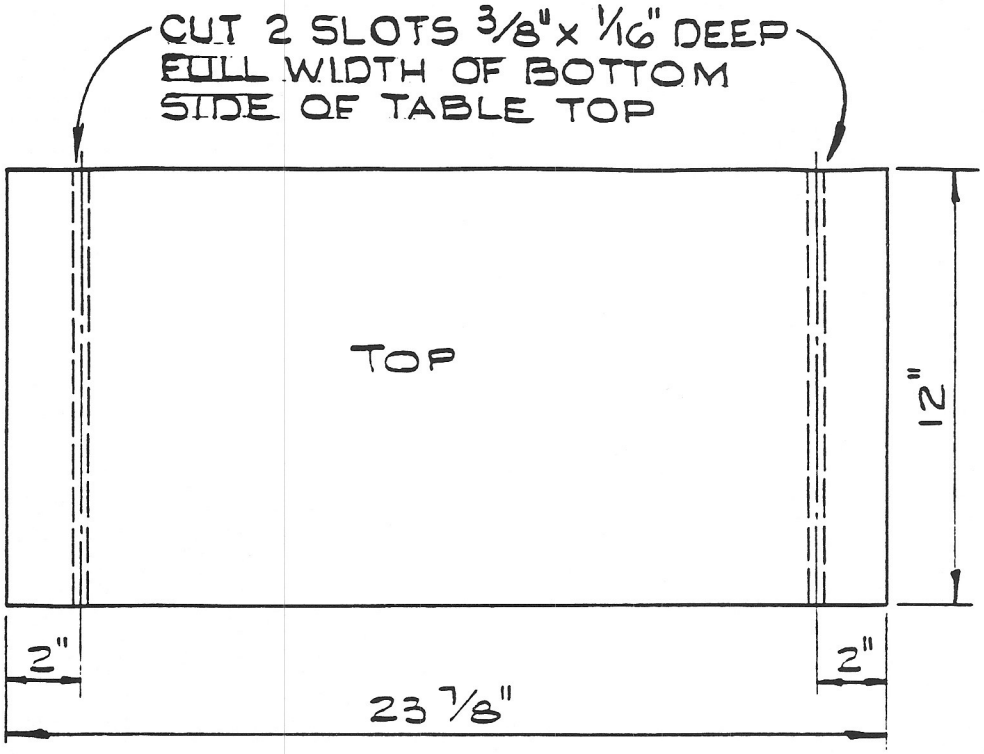
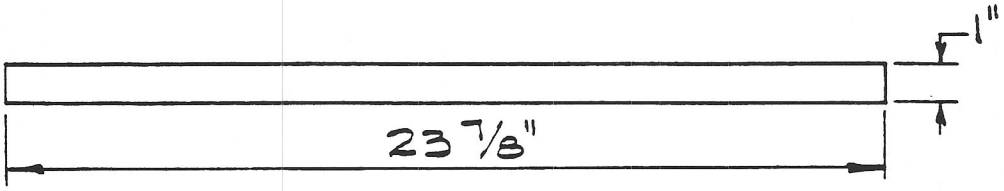
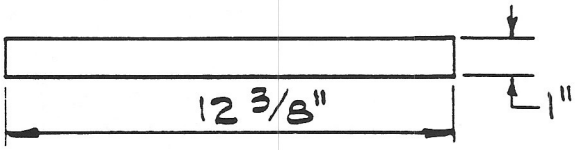


TABLE TOP



EDGE PIECE



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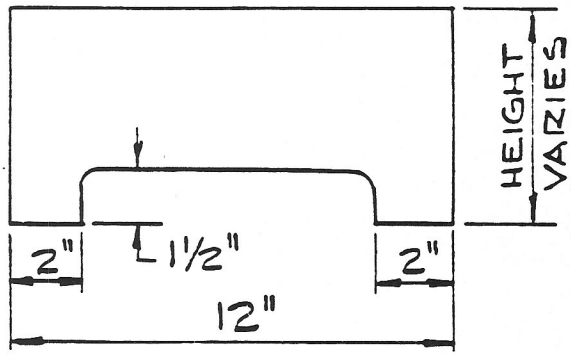
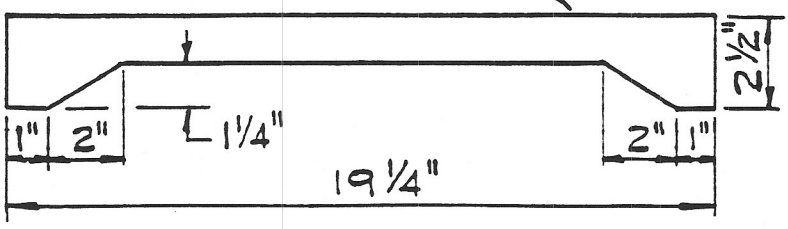


LEG

FOR CENTER BRACE GLUE TWO PIECES OF PLYWOOD SHEETS TOGETHER AND CUT AS SHOWN



CENTER BRACE

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FLOOR TABLES

CUTTING SCHEME DETAIL

This cutting scheme is to cut out one 4" high, one 6", one 8", one 10", one 12" and one 14" high floor tables. We suggest the following cutting sequence to avoid difficulties with the amount of wood removed by the saw cut: make six cuts of full 12" starting from the left. Cut the first three across to give six pieces 12" by 23-7/8". Then cut the next two to get pairs of legs of 4", 6", 10", 12", and 14". Cut the sixth 12" strip to give a pair of 8" legs, then cut six pairs of 1" edge pieces that are 12-3/8" long. Finally, cut the 12 pieces that will become the six center braces.

CONSTRUCTION SUGGESTIONS

Use 3/8" plywood, as it is strong yet light in weight. The ideal plywood is "Baltic Birch," made in Finland of seven plies of birch veneer. Quite satisfactory is U.S.-made birch plywood. A-A grade fir plywood is also satisfactory, but requires more sanding, especially the ends and corners.

Cut out pieces according to the cutting scheme, remembering where the saw kerf will occur. Glue the two brace pieces together for each table, then make the underside cuts that will provide leg clearance. Using a saber saw, make the "feet" on the side pieces. The 1/16" deep x 3/8" wide slots cut across the underside of each table top are not an absolute requirement, but they do assure a squared assembly and perhaps additional stability.

Sand all pieces well before assembly.

Assemble the table beginning with the long edge piece on the tabletop, then the edge pieces along the sides. Use Elmer's Carpenter Glue or equivalent with 1" x #17 wire brads. The brads hold the parts together until the glue does its work. Now sand the corners to remove all sharp angles. Glue and nail (same size brads) both side pieces into their slots. Finally, glue and nail the center brace in place. Conclude the assembly by sanding the corners of the feet.

Varnish using three coats of Varathane gloss varnish, sanding lightly between coats.

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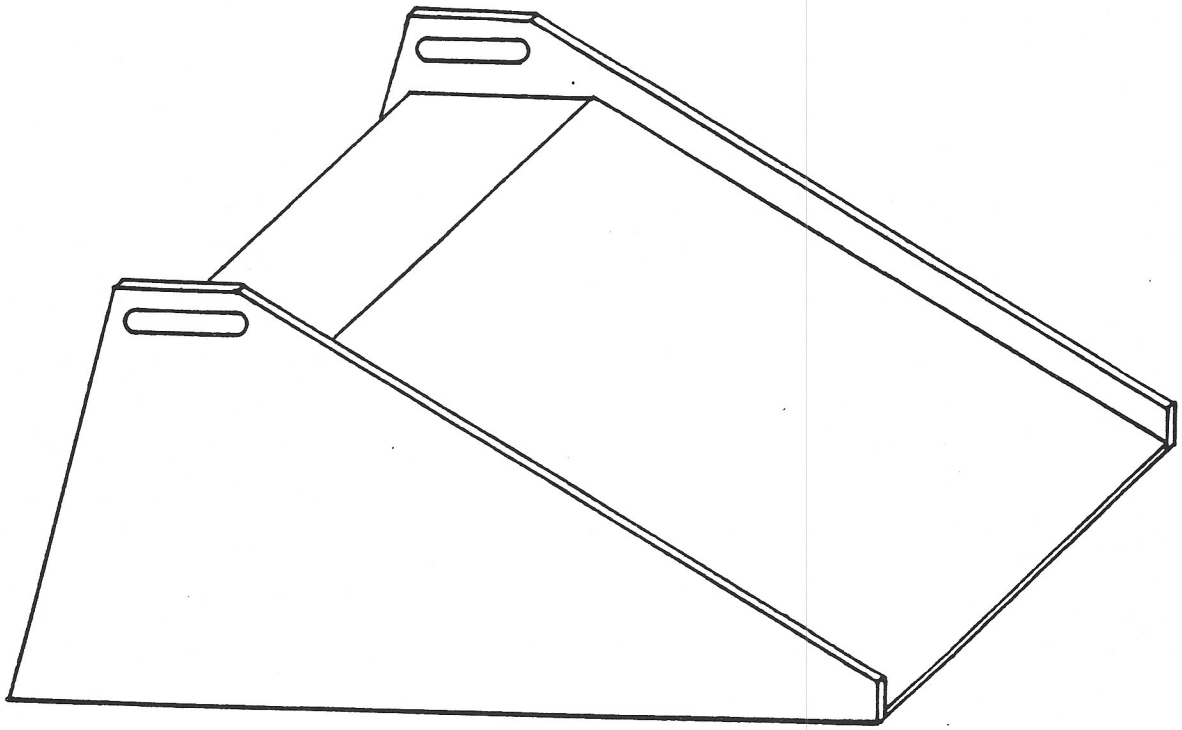
SLIDE FOR THE YOUNGER CHILD

This is a small slide for children to climb up and slide down. It is large enough to be functional, yet small enough to be carried in the trunk or back seat area of even compact cars. Also it is lightweight and strong enough for rough-and-tumble use.



This little slide is an ideal height for the very young child. The child can crawl up to the slide, pull himself up to standing, and just by bending at the waist begin to slide down head-first. Because the end of the slide is right on the floor, the child can also crawl up the ramp. It is also great for rolling cars down.

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SLIDE FOR THE YOUNGER CHILD

Materials needed:

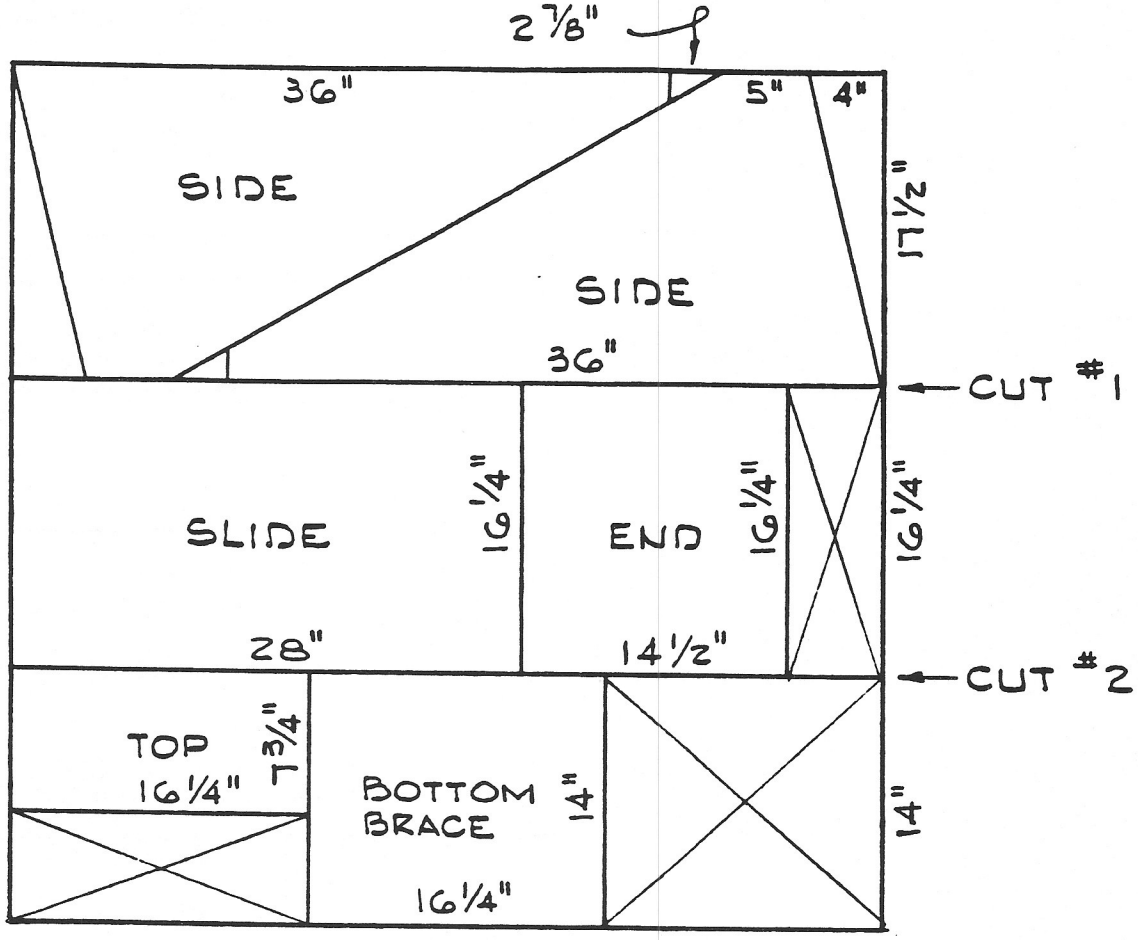
- 1 4' x 4' x 3/8" sheet of birch plywood, cut to sizes as shown on cutting scheme and piece detail drawings
- Elmer's Carpenter Glue
- Wire brads: 1" x #17
- Varathane gloss varnish

Tools needed:

- Table saw
- Sander
- Fine sandpaper
- 1-1/8" power wood boring bit and electric drill
- Saber saw
- Hammer
- Ruler
- Square
- Brush

SLIDE FOR THE YOUNGER CHILD

This is the cutting scheme for one slide. To get the full dimensions, make the first cut as noted, then the second cut as noted. Use one 4' x 4' x 3/8" sheet of plywood.



CONSTRUCTION SUGGESTIONS

Use 3/8" plywood, as this is strong, yet lightweight. The ideal plywood is "Baltic Birch," made in Finland of seven plies of birch veneer. U.S.-made birch plywood is quite satisfactory. A-A grade fir plywood is also satisfactory, but requires more sanding, especially on ends and corners.

Cut out the pieces according to the cutting scheme, keeping in mind where the saw kerf will occur.

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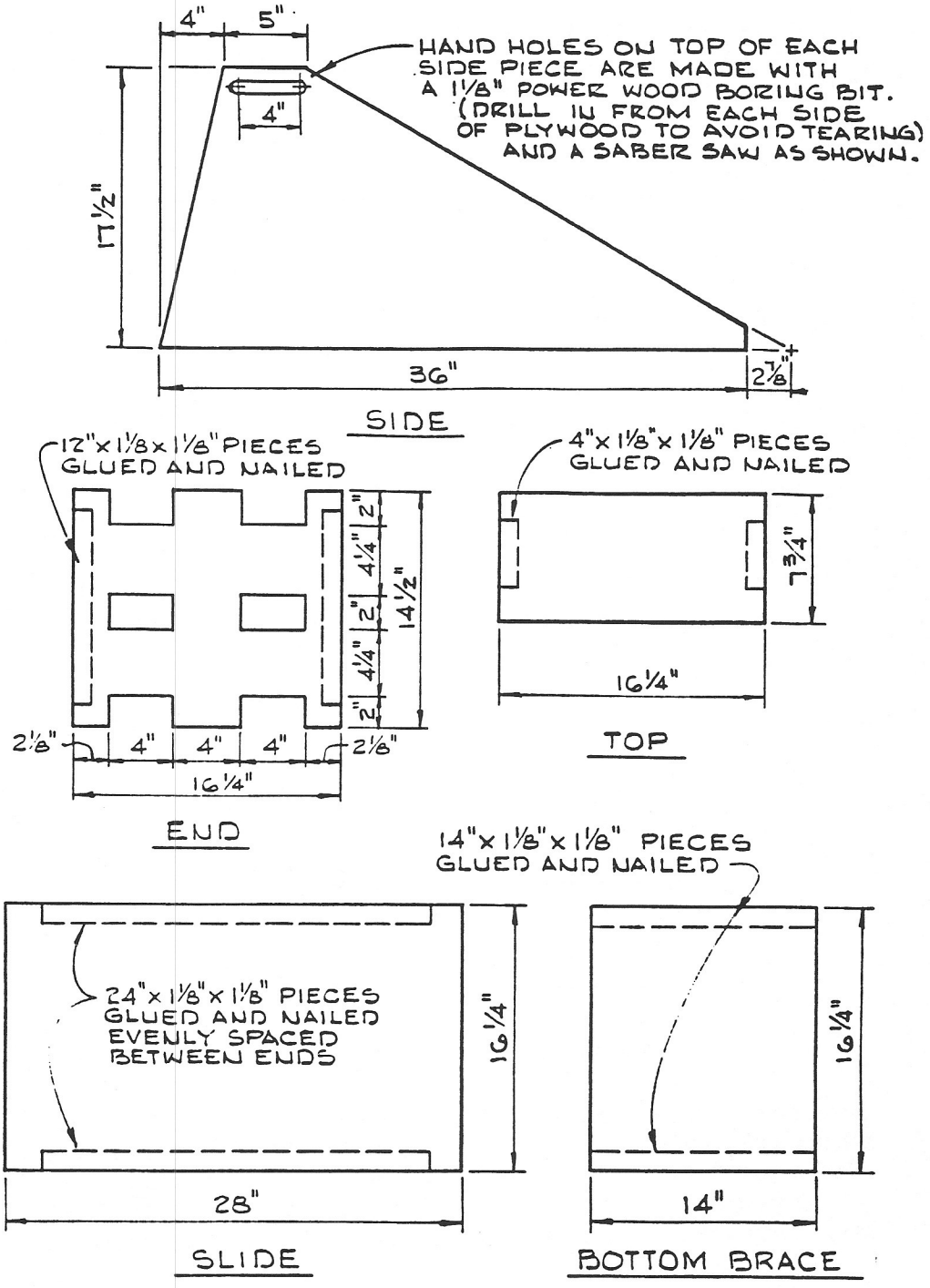
SLIDE FOR THE YOUNGER CHILD



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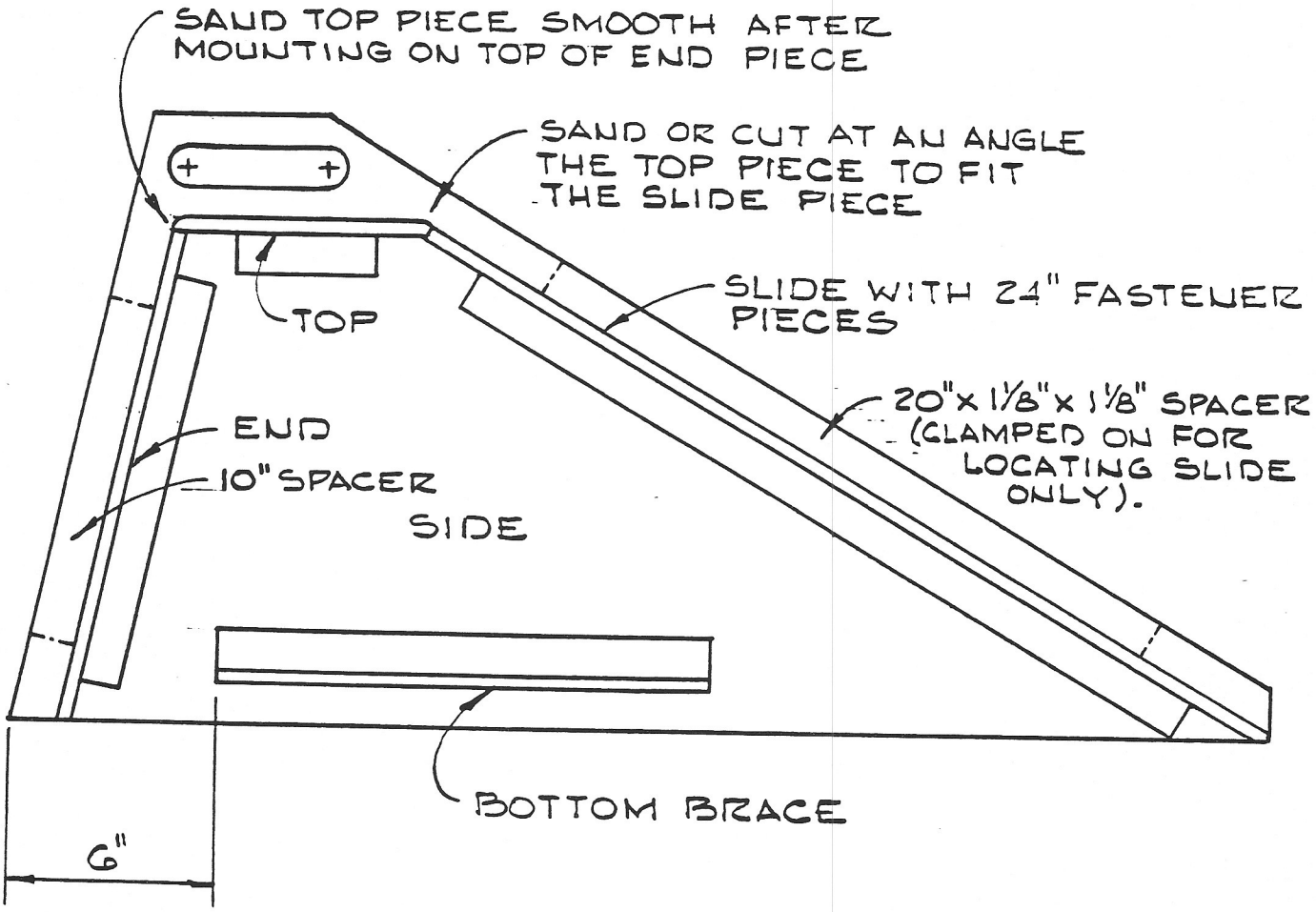
SLIDE FOR THE YOUNGER CHILD


SAND TOP PIECE SMOOTH AFTER MOUNTING ON TOP OF END PIECE
SAND OR CUT AT AN ANGLE THE TOP PIECE TO FIT THE SLIDE PIECE
SLIDE WITH 24" FASTENER PIECES
TOP
20"x 1⅛"x 1⅛" SPACER (CLAMPED ON FOR LOCATING SLIDE ONLY).
END
10" SPACER
SIDE
BOTTOM BRACE
6"

SECTION VIEW SHOWING
THE SLIDE, TOP, END AND BOTTOM BRACE GLUED AND NAILED TO THE SIDE

Finish the construction by sanding any missed rough edges or corners and by applying one coat of "Varathane" gloss varnish or equal to the underside and three coats to the outside, sanding lightly between coats.

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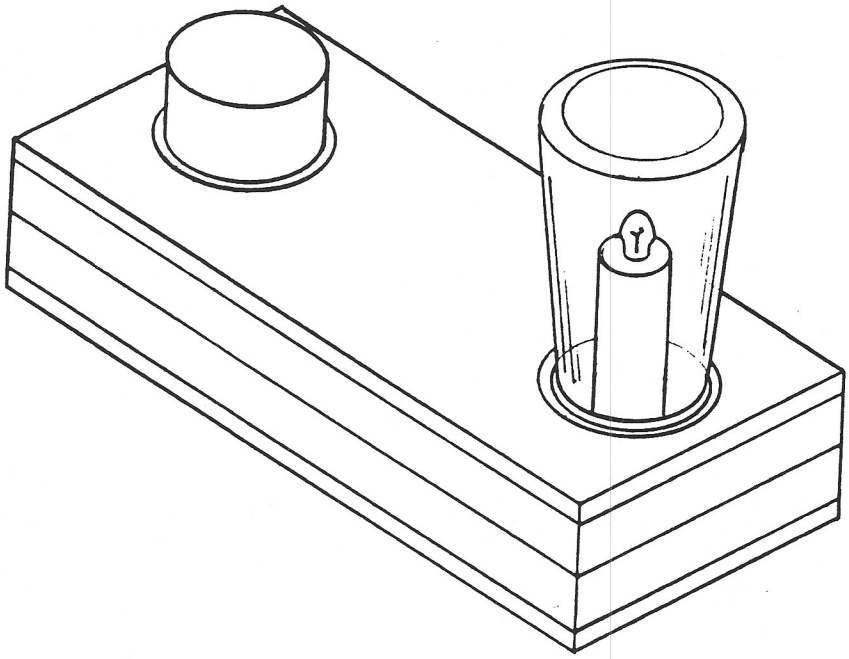
ATTENTION LIGHT WITH SWITCH

An early cause-and-effect toy, this light switch is activated with a simple push on the large button. The light stays on until the button is pushed again.



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ATTENTION LIGHT WITH SWITCH

Materials needed:

- 2 pieces 3/4" (full) x 4" x 9" pine wood
- 2 pieces 1/4" (full) x 4" x 9" pine wood (can be plywood)
- 1 dowel: 3/4" diameter x 3½" dowel
- 1 switch: Radio Shack #275-1555
- 1 battery holder for 2 "D" cells: Radio Shack #270-386
- 1 PR3 flange-base bulb - Radio Shack
- Wire: Radio Shack hook-up wire #278-1307
- Bright color "Varathane" or equivalent enamel
- 4 Phillips tapping screws: 1½" x #6
- 1 sheet metal screw: 1/2" x #6
- 4 round-head wood screws: 3/8" x #2
- 1 Gerber clear plastic 4-oz. "Nurser" nursing bottle
- 1 4" x 9" non-skid or felt
- 2 "D" cell batteries
- Sheet metal: 5/8" x 2" x 1/32" or similar
- Plastic cap from a pressure can of spray paint or shaving cream. The smaller cap (1-7/8" diameter body) is preferred.

Tools needed:

- Table saw and saber saw
- Adjustable circle cutter and drill press
- Power drill and set of drill bits
- Elmer's Carpenter's Wood Glue
- Sanding equipment
- Ruler
- Paint brush
- Soldering iron and solder
- Screwdriver, etc.

ATTENTION LIGHT WITH SWITCH

CONSTRUCTION SUGGESTIONS

Cut wood pieces to size. On the two 3/4" thick pieces, locate and mark the square area where the battery holder will be. Drill a hole 5/8" in diameter at the corner points of the square areas. Using the saber saw, cut from hole to hole around the squares of the two pieces. Then locate the centers of the holes to be cut on each side of the battery holder opening on the two 3/4" pieces and on one of the 1/4" pieces.

On the underside of one of the 3/4" pieces, and using an adjustable circle cutter in a drill press, drill a hole 3/8" deep only and of a diameter to provide a loose fit for the plastic cap shoulder. Then adjust the circle cutter and drill the rest of the way through the 3/4" piece at a diameter to provide a loose fit for the cap body.

Glue one of the 1/4" x 4" x 9" pieces on top of the 3/4" piece just drilled and drill the adjusted diameter size hole on through this piece. Move over to the other side of the battery holder opening and make the other hole as shown on the drawing. Set the adjustable circle cutter for a 2" hole and drill this straight through.

On the other 3/4" x 4" x 9" piece locate the center point for the switch, and the center of the 3/4" diameter x 3" dowel. Drill a hole 3/4" in diameter and 1/2" deep for the dowel. Then either saw or chisel a narrow slot from the battery holder hole to the center point for the switch and the dowel hole. Drill a hole 3/8" in diameter x 1/2" deep down one end of the dowel. Then glue the other end of the dowel in the dowel hole. Make the "S" bracket from sheet metal according to the drawing, fasten the switch to the bracket, and screw the assembly in place so the switch is over its center point.

Cut and solder wires as shown on drawing.

Take the screw-on collar from the nursing bottle and drill three holes 1/16" in diameter through the collar flange. Put the collar over the wired-up dowel, and screw down onto the 3/4" x 4" x 9" piece.

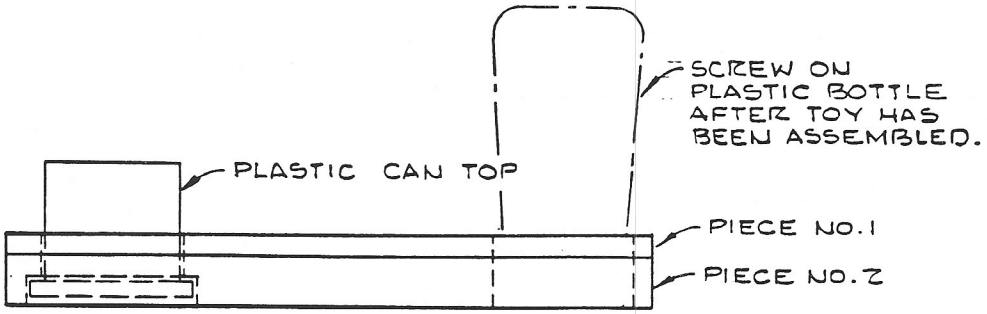
Glue the bottom 1/4" x 4" x 9" piece to the 3/4" x 4" x 9" piece.

Place the plastic cap on the switch and insert the "D"-cell batteries in the battery holder. Clamp the top on and drill a hole 3/32" in diameter in each corner from the bottom up and screw together with the 1½" x #6 screws.

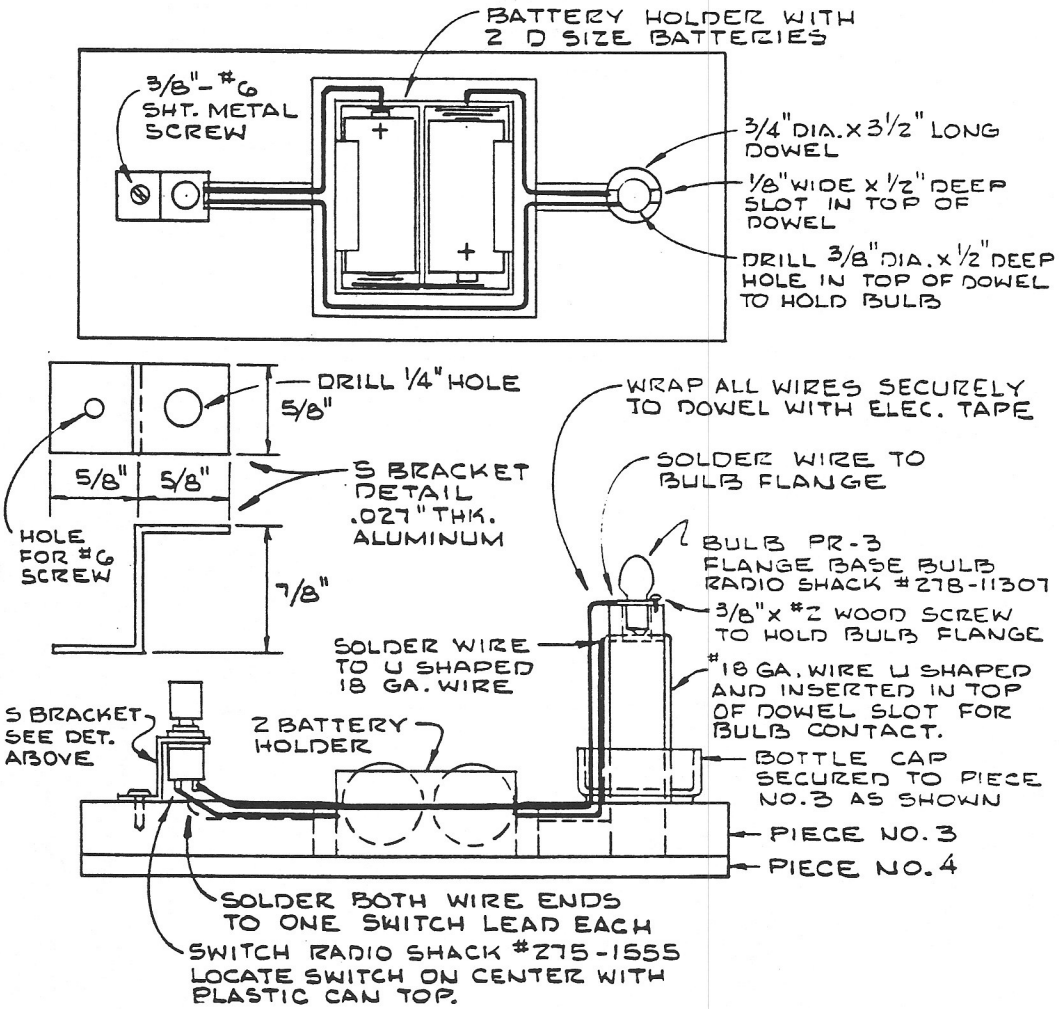
CONSTRUCTION SUGGESTIONS
Cont.

Sand overall; paint a bright color and when the paint is dry, apply either a non-skid material or felt to the bottom.

Now invert the nursing bottle over the dowel and twist it securely into the fastened collar.



SIDE VIEW OF PIECES No.1 & 2 GLUED TOGETHER

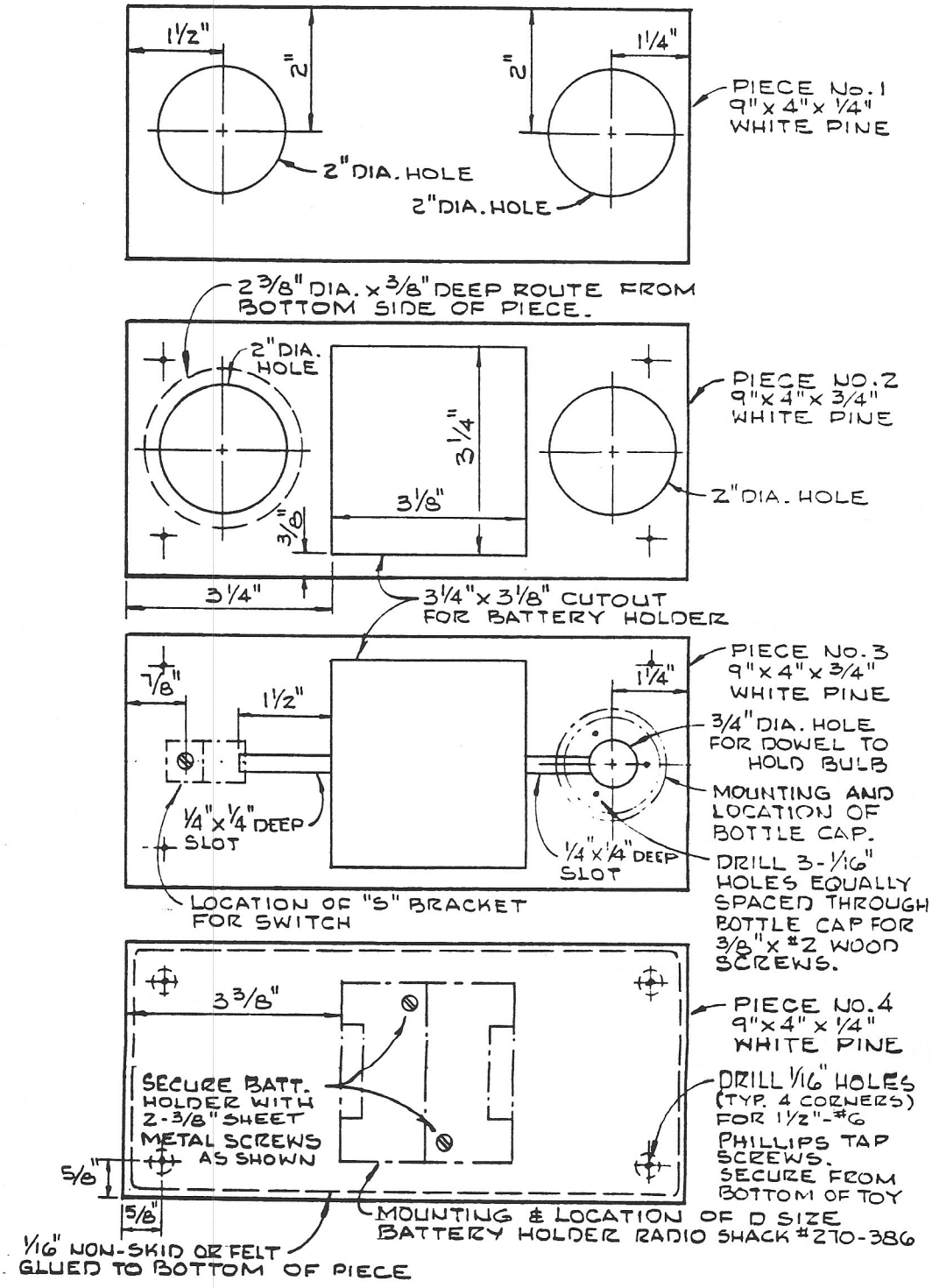

BATTERY HOLDER WITH 2 D SIZE BATTERIES
3/8"-#6 SHT. METAL SCREW
3/4" DIA. x 3 1/2" LONG DOWEL
1/8" WIDE x 1/2" DEEP SLOT IN TOP OF DOWEL
DRILL 3/8" DIA. x 1/2" DEEP HOLE IN TOP OF DOWEL TO HOLD BULB
DRILL 1/4" HOLE
5/8"
5/8"
5/8"
S BRACKET DETAIL .027" THK. ALUMINUM
HOLE FOR #6 SCREW
7/8"
WRAP ALL WIRES SECURELY TO DOWEL WITH ELEC. TAPE
SOLDER WIRE TO BULB FLANGE
BULB PR-3 FLANGE BASE BULB RADIO SHACK #278-11307
3/8" x #2 WOOD SCREW TO HOLD BULB FLANGE
SOLDER WIRE TO U SHAPED 18 GA. WIRE
#18 GA. WIRE U SHAPED AND INSERTED IN TOP OF DOWEL SLOT FOR BULB CONTACT.
S BRACKET SEE DET. ABOVE
2 BATTERY HOLDER
BOTTLE CAP SECURED TO PIECE NO.3 AS SHOWN
PIECE NO.3
PIECE NO.4
SOLDER BOTH WIRE ENDS TO ONE SWITCH LEAD EACH
SWITCH RADIO SHACK #275-1555 LOCATE SWITCH ON CENTER WITH PLASTIC CAN TOP.

WIRING DIAGRAM

TOP AND SIDE VIEWS SHOWN WITH PIECES NO.3 AND 4 GLUED TOGETHER

(c) 1987 THE NATIONAL LEKOTEK CENTER

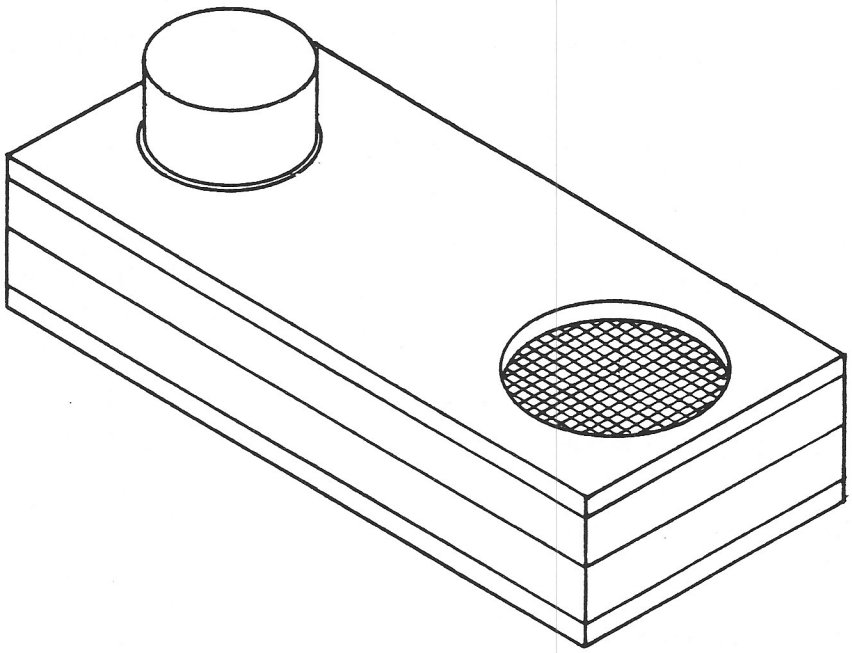
ATTENTION LIGHT WITH SWITCH



(c) 1987 THE NATIONAL LEKOTEK CENTER

ATTENTION BUZZER WITH SWITCH

This cause-and-effect toy is a little noisy for parents, but children love pushing the button on and off to hear the loud buzz. Particularly enjoyed by children with a hearing loss, as the buzz is loud enough for them to hear.



(c) 1987 THE NATIONAL LEKOTEK CENTER

ATTENTION BUZZER WITH SWITCH

Materials needed:

- 2 pieces 3/4" (full) x 4" x 9" pine wood
- 2 pieces 1/4" (full) x 4" x 9" pine wood (can by plywood)
- 1 switch: Radio Shack #275-1555
- 1 battery holder for 1 "D" cell: Radio Shack #270-403
- 1 Piezo buzzer: Radio Shack #273-066
- Wire: Radio Shack hook-up wire #278-1307
- Bright color Varathane or equivalent enamel
- 4 Phillips tapping screws: 1½" x #6
- 1 "D" cell battery
- 3" x 3" metal screen wire
- 4" x 9" non-skid material or felt
- Plastic cap from a pressure can of spray paint or shaving cream. The smaller cap (1-7/8" diameter body) is preferred.
- Tacks or staples
- 2 round-head wood screws: 3/8" x #2

Tools needed:

- Table saw and saber saw
- Adjustable circle cutter and drill press
- Power drill and set of drill bits
- Elmer's Carpenter Wood Glue
- Sanding equipment
- Ruler
- Paintbrush
- Soldering iron and solder
- Screwdriver, etc.

ATTENTION BUZZER WITH SWITCH

CONSTRUCTION SUGGESTIONS

Cut the wood pieces to size. On the two 3/4" thick pieces, locate and mark the square area where the battery holder will be. Drill a hole 5/8" in diameter at the corner points of the square area. Using the saber saw, cut from hole to hole around the squares of the two pieces. Then locate the centers of the holes to be cut on each side of the battery holder opening on the two 3/4" thick pieces and on one of the 1/4" thick pieces.

On the underside of the top 3/4" x 4" x 9" piece, and using an adjustable circle cutter in a drill press, drill a hole 3/8" deep and of a diameter to provide a loose fit for the plastic cap shoulder. Then adjust the circle cutter and drill the rest of the way through the 3/4" piece at a diameter to provide a loose fit for the cap body.

Now clamp one of the 1/4" x 4" x 9" pieces on top of the 3/4" one just drilled and drill the adjusted diameter size hole on through this piece. Move over to the other size of the battery holder opening and mark the other hole as shown on the drawing. Set the adjustable circle cutter for the 2½" diameter hole as shown in the drawing and drill this straight through the 1/4" top piece and both of the 3/4" pieces, clamped together.

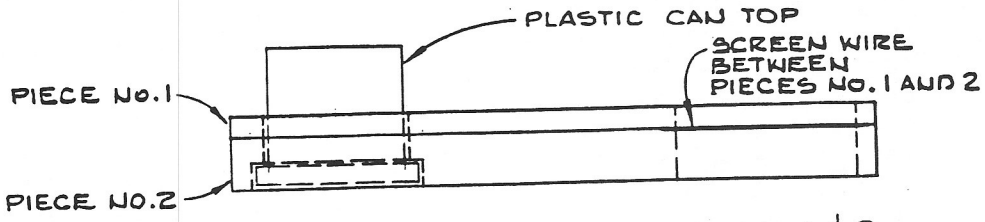
The piece of 3" x 3" screen wire is to be cut into a disc 3" in diameter. It is to be mounted over the 2½" hole just drilled between the top 1/4" piece and the 3/4" piece. To do this, a small ledge of wood has to be cut from around the 2½" hole in the 3/4" piece. When this is done, the screen is stapled in place and the 1/4" piece is glued to the 3/4" piece. Also, the bottom 1/4" piece is glued to the other 3/4" piece and the Piezo buzzer is placed in the 2½" diameter hole and screwed to the bottom piece with two 3/4" x #2 round-head screws.

Cut and solder all wires as shown on the drawing.

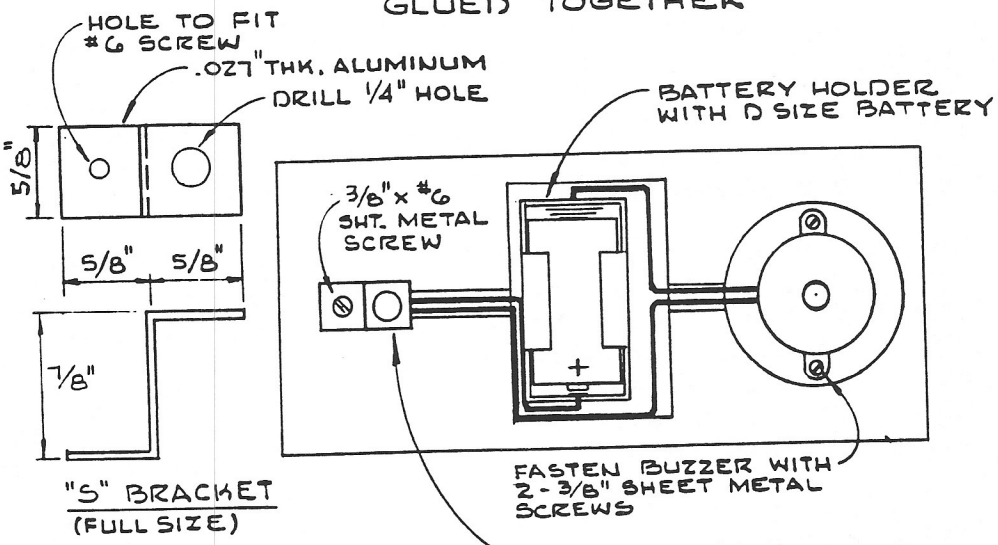
Place the plastic cap on the switch and insert the "D"-cell battery into the battery holder. Clamp on the top and drill a hole 3/32" in diameter in each corner from the bottom up; screw the top and bottom sections together with the 1½" x #6 screws.

Sand overall and paint a bright color. When the paint is dry, apply either felt or another non-skid material to the bottom.

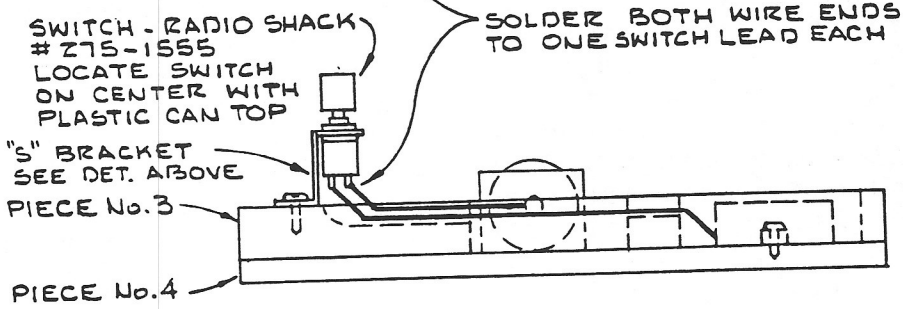
ATTENTION BUZZER WITH SWITCH



SIDE VIEW OF PIECES No. 1 & 2 GLUED TOGETHER



"S" BRACKET (FULL SIZE)

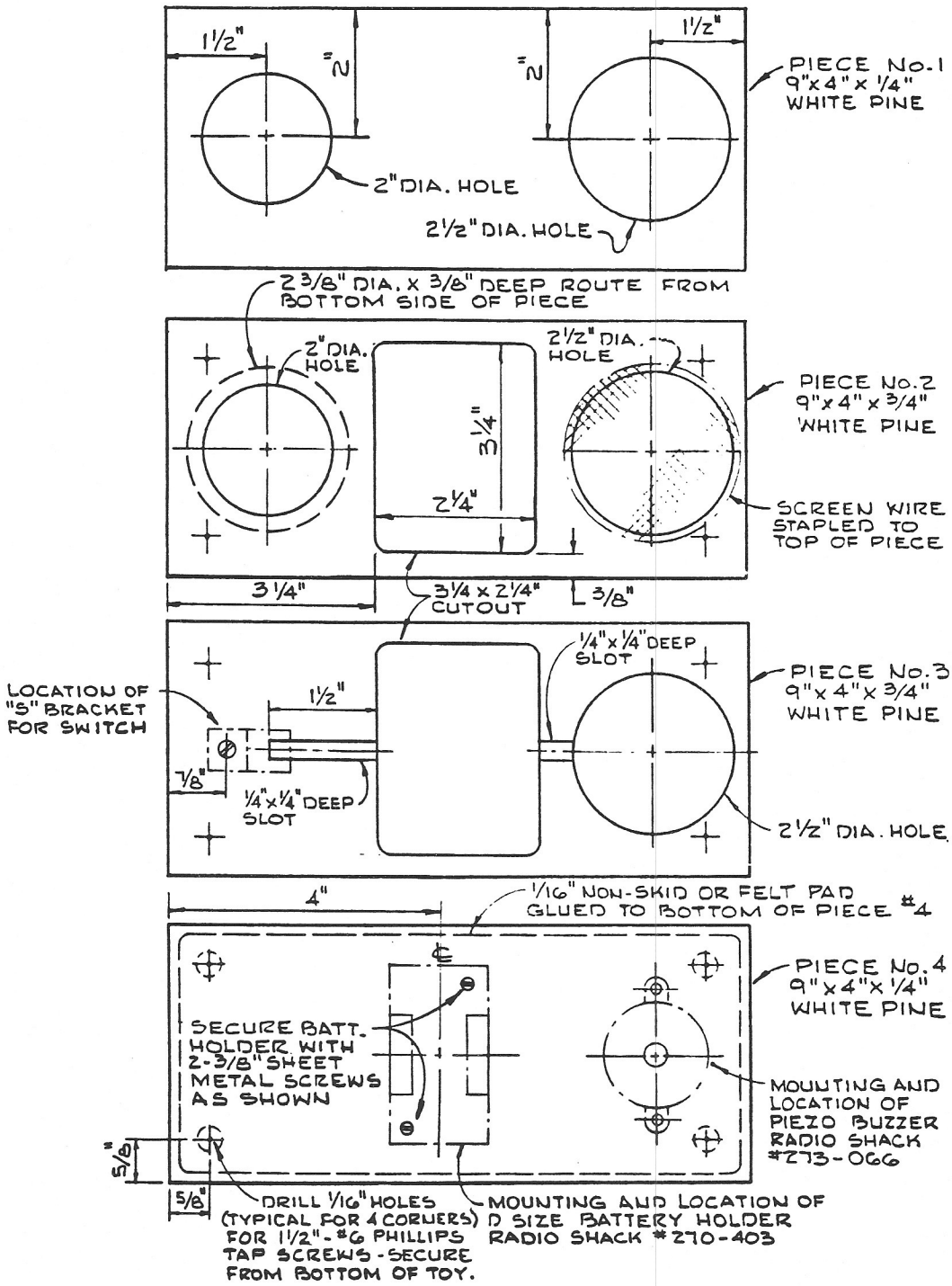

SWITCH - RADIO SHACK #275-1555 LOCATE SWITCH ON CENTER WITH PLASTIC CAN TOP
SOLDER BOTH WIRE ENDS TO ONE SWITCH LEAD EACH
"S" BRACKET SEE DET. ABOVE
PIECE No.3
PIECE No.4

WIRING DIAGRAM

TOP AND SIDE VIEWS SHOWN WITH PIECES NO. 3 AND 4 GLUED TOGETHER

(c) 1987 THE NATIONAL LEKOTEK CENTER

ATTENTION BUZZER WITH SWITCH



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ADAPTING BATTERY-OPERATED TOYS FOR REMOTE OPERATION

Most battery-powered toys have a small OFF/ON switch in a not-too-prominent position. The switch is usually very difficult for the handicapped child to find and/or operate.

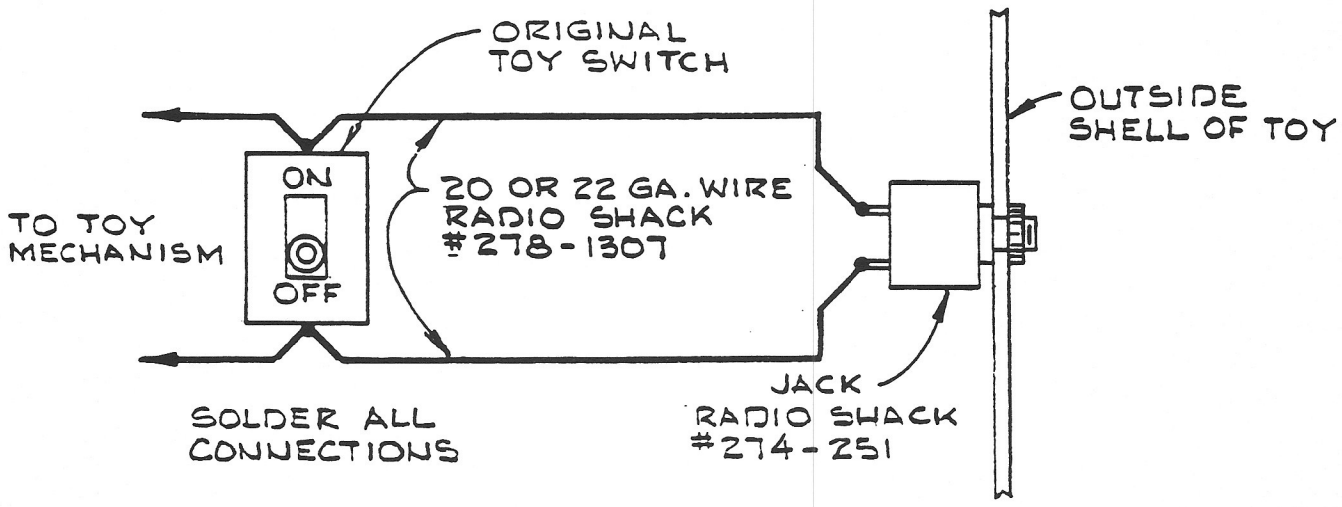
The objective is to provide an easy-to-operate remote switch that will allow the child to operate the toy.

To accomplish this modification, the toy must be partially disassembled to permit access to the switch wiring. There have been a few instances in which this was impossible, since the toy would be destroyed in disassembly. It is advisable to select toys that can be disassembled for modification.

A jack is positioned in the outer shell of the toy to allow a plug to be inserted and yet not hinder the operation of the toy, for instance, on the side, on the back or, in some cases on top of the toy. The jack recommended is Radio Shack #274-251 or equivalent. This jack uses Radio Shack plug #274-286 for the wire to the switch. Refer to Lekotek Plan #8 for details of the switch. The jack is mounted by drilling a hole in the toy of the correct size to permit the threaded neck of the jack to pass through and the locking collar screwed on the outside and secured.

From the jack positioned on the toy, solder a wire from each terminal to the wires on the switch of the toy. This arrangement does not change the switch on the toy and permits operation with either this switch or a remote switch. Keep connecting wires as short as possible and clear operating parts when the toy is reassembled.

SCHEMATIC WIRING DIAGRAM (Typical)



SCHEMATIC WIRING DIAGRAM (TYPICAL)

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ADAPTING BATTERY-OPERATED TOYS FOR REMOTE OPERATION

Materials needed per toy:

- #20 gauge wire: Radio Shack #278-1307
- Jack: Radio Shack #274-251
- Rosin core solder

Tools needed:

- Small size soldering iron
- Set of small drill bits
- Electric drill
- Pliers
- Knife
- Screwdrivers

BUSY BOX

This electronic busy box has several unique features that make it ideal for a child with physical disabilities:

1. Only a light touch is necessary to activate any of the four panels.
2. The box is not very deep, so even a child who has difficulty extending his arms will be able to reach each activity area.
3. The texture of each panel is different, thereby providing tactile stimulation and enjoyment.

The first pad on the left is a simulated door, which activates an electronic chime when pressed. The second pad is an acrylic mirror with two lights and a buzzer, which is activated by pressing the mirror. The third pad is a vibrator, activated by pressing down. The fourth pad on the right is covered with a piece of short-nap carpet. When pressed down, it activates the circuit board to produce a melody.

This BUSY BOX requires four "C" batteries and one "AA" battery (on the circuit board). A cushion foot placed on each corner of the bottom will prevent marking table tops (Radio Shack #64-2346).

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BUSY BOX

Materials needed for one Busy Box:

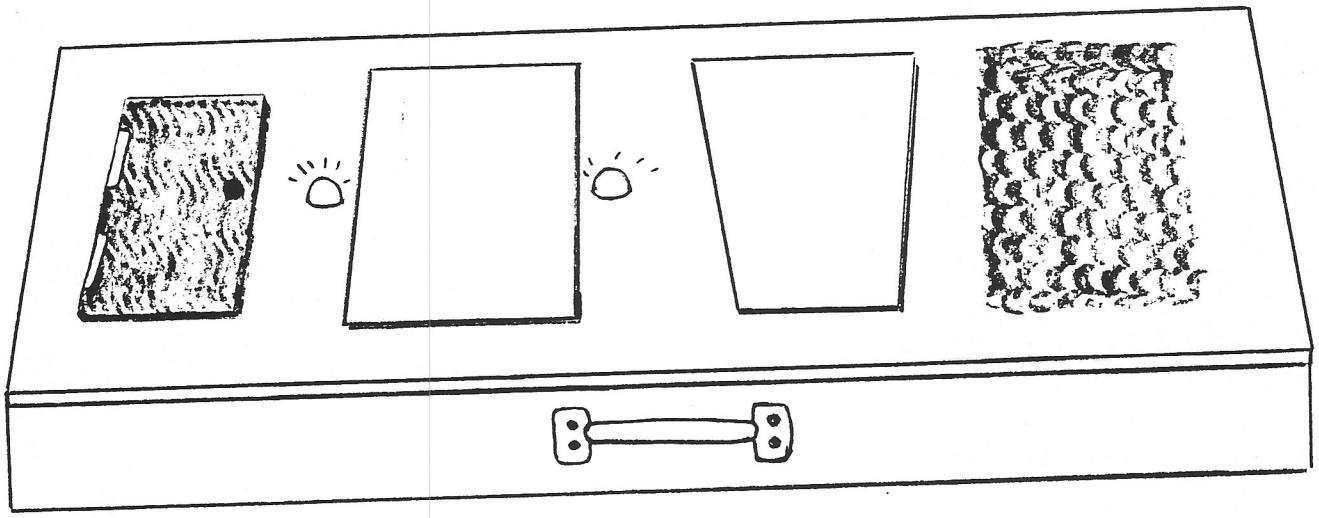
- 18" x 22½" x 3/8" birch plywood, cut to sizes and with bevels and angles as shown in drawings
- 4" x 4" x ¼" foam sponge)
- 4" x 4" x 3/8" foam sponge) Cut to various sizes as shown on drawings
- 4" x 4" x 3/4" foam sponge)
- 2" x 2" 16-mesh screen, plastic or wire
- 4 rubber bumpers - 3/8" or ½" (for feet)
- 3-7/8" x 2¼" x 3/16" plywood)
- 4½" x 3¼" x 3/32" acrylic mirror)Drill holes
- 4¼" x 3-3/8" to 2-5/8" x ¼" clear Plexiglas)and attach
- 4" x 2-5/8" x 3/16" plywood)sponge as shown
- 4" x 2-5/8" short-nap carpeting)on drawings
- 8 pan head sheet metal screws, each 3/4" x #8
- 8 soft rubber washers, each 3/8" diameter
- 2" x 2" piece of ¼" clear lexan plastic
- Hot melt glue
- Plexite cement (to bond lexan)
- Elmer's Carpenter Glue
- 1" x #17 wire brads
- 4 flathead Phillips screws, each 1" x #6
- Varathane gloss varnish
- 2 battery holders: Radio Shack #270-385 for two C-size batteries
- 1 speaker: 2¼" Radio Shack #40-246
- 1 motor: Radio Shack #273-222
- 4 "C" batteries
- 1 flashlight lamp, PR-2: Radio Shack #272-1120
- 1 "AA" battery
- 1 buzzer: Radio Shack #273-053
- 1 electronic chime: Radio Shack #273-067
- #20 gauge wire: Radio Shack #278-1307
- 4 "Alco" catalog 3P-119 "John Meshua, Jr., Inc., Surplus Electronic Material," P.O. Box 62, East Lyn, Massachusetts 01904
- 1 circuit board #CB 7910-7910, Melody IC 7910-7910 CE S MOS Systems, Inc., 50 West Brokaw Road, Bldg 7, San Jose, California 95110
- Miscellaneous metal strips and small wood blocks with small mounting screws, rosin core solder, window sash handle

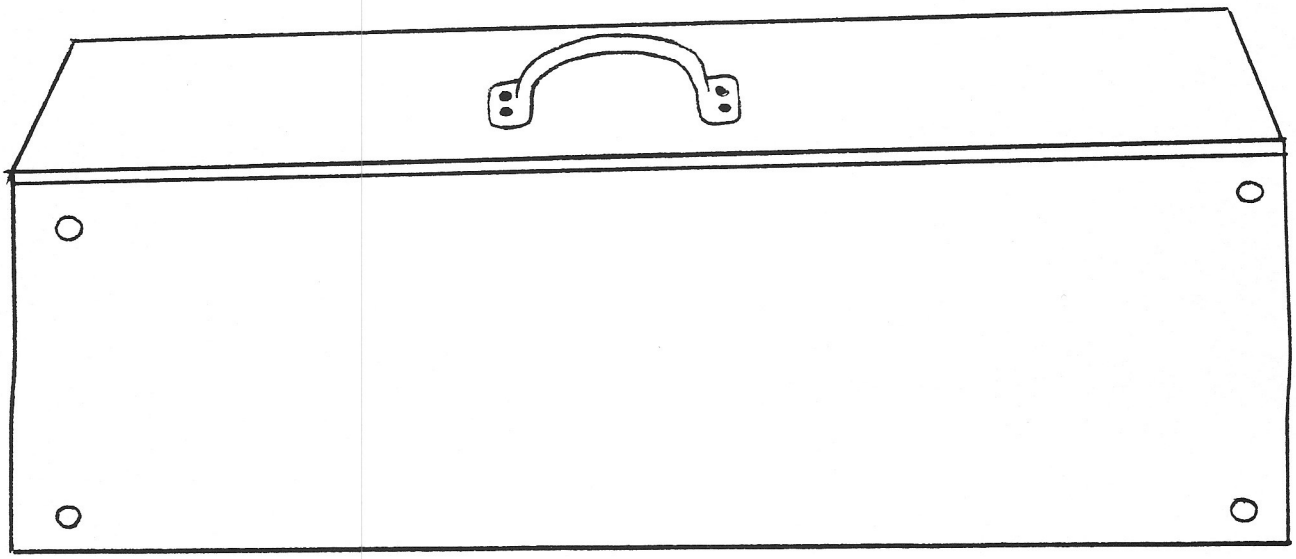
BUSY BOX

Tools needed:

- table saw
- sander
- fine sandpaper
- set of drill bits
- electric drill
- hot melt glue gun
- small soldering iron
- hammer
- ruler
- square
- brush
- scissors
- pliers
- screwdriver
- knife

BUSY BOX





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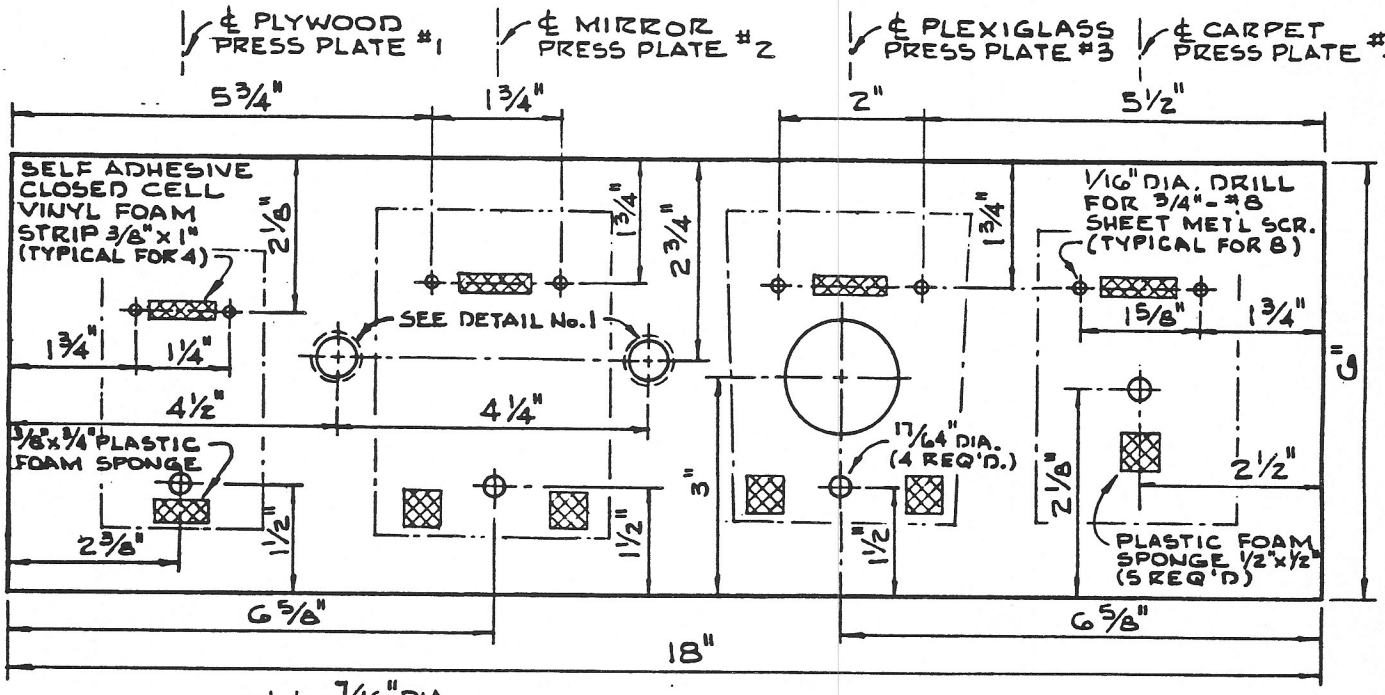
BUSY BOX



TOP PANEL LAYOUT

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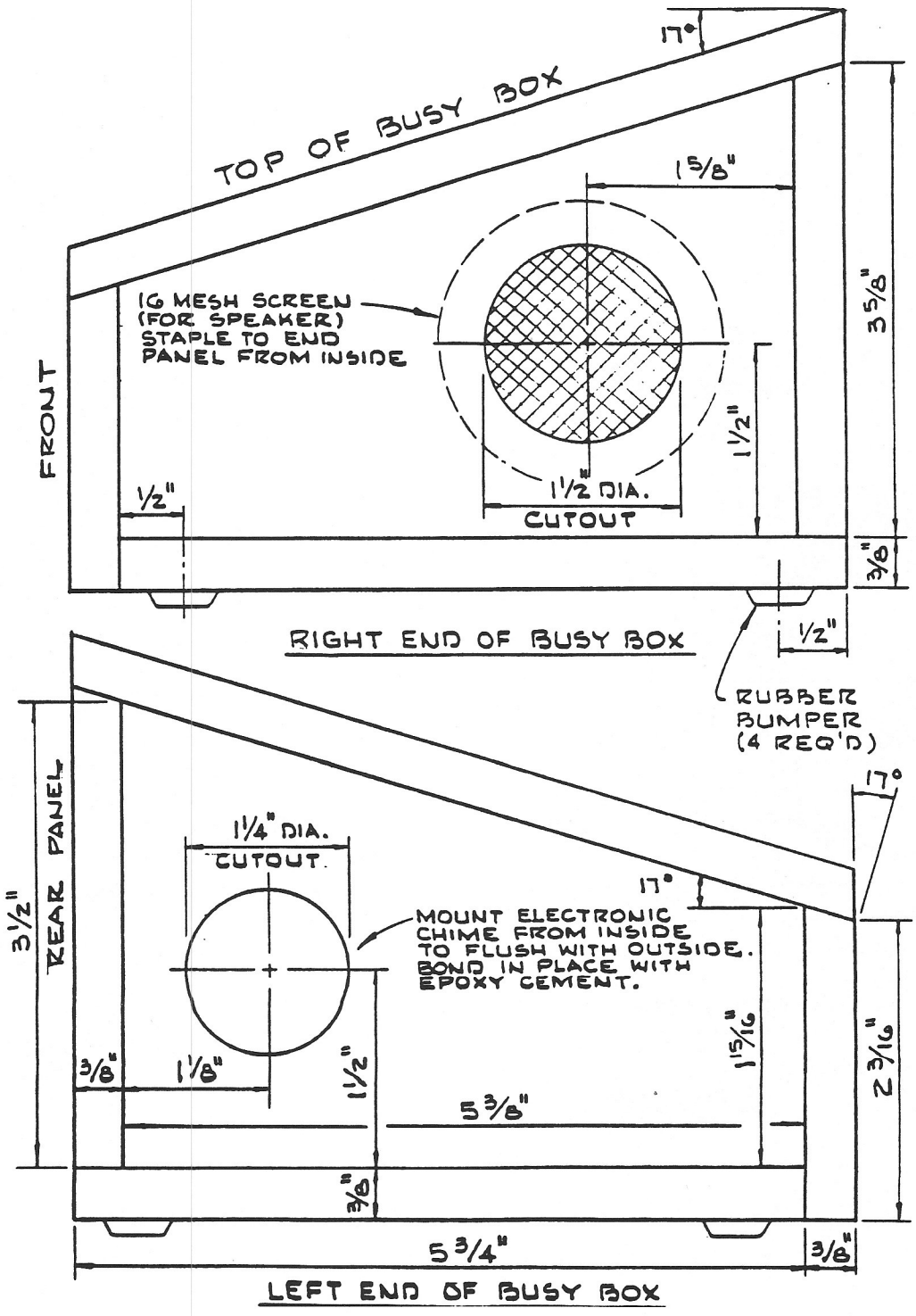
BUSY BOX



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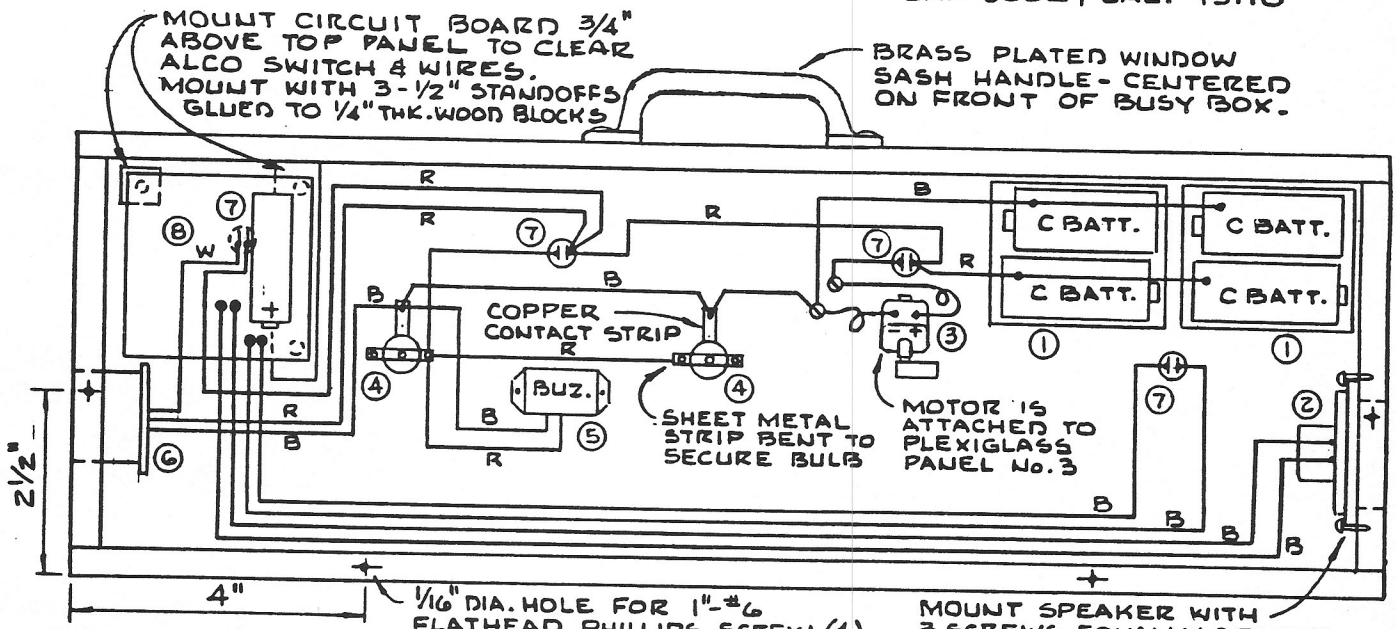
BUSY BOX

LIST OF MATERIALS

1. BATTERY HOLDER (2) RADIO SHACK #270-385
   4 C SIZE BATTERIES
2. SPEAKER, 2 1/4" RADIO SHACK #40-246
3. MOTOR, RADIO SHACK #273-222
4. FLASHLIGHT LAMP PR-2
   RADIO SHACK #272-1120
5. BUZZER, RADIO SHACK #273-053
6. ELECTRONIC CHIME, RADIO SHACK #273-067
7. SWITCH (4), ALCO CAT. SP-119
   JOHN MESHNA, JR. INC.
   SURPLUS ELECTRONIC MAT'L.
   P.O. BOX 62
   EAST LYNN, MASS. 01904
8. CIRCUIT BOARD #CB7910
   7910 MELODY IC #7910-7910-CE
   S MOS SYSTEMS, INC.
   50 W. BROKAW RD. BLDG. 7
   SAN JOSE, CAL. 95110


MOUNT CIRCUIT BOARD 3/4" ABOVE TOP PANEL TO CLEAR ALCO SWITCH & WIRES. MOUNT WITH 3-1/2" STANDOFFS GLUED TO 1/4" THK. WOOD BLOCKS
BRASS PLATED WINDOW SASH HANDLE - CENTERED ON FRONT OF BUSY BOX.
C BATT.
C BATT.
C BATT.
C BATT.
COPPER CONTACT STRIP
BUZ.
SHEET METAL STRIP BENT TO SECURE BULB
MOTOR IS ATTACHED TO PLEXIGLASS PANEL No. 3
2 1/2"
4"
1/16" DIA. HOLE FOR 1"-#6 FLATHEAD PHILLIPS SCREW (4) TO SECURE BOTTOM PANEL
MOUNT SPEAKER WITH 3 SCREWS EQUALLY SPACED

ALL WIRE AWG #20
OR #22 STRANDED
B = BLACK WIRE
R = RED WIRE
W = WHITE WIRE

VIEW INSIDE BUSY BOX
WITH BOTTOM PANEL REMOVED

SECURE LOOSE WIRING WHERE NECESSARY WITH HOT MELT GLUE.

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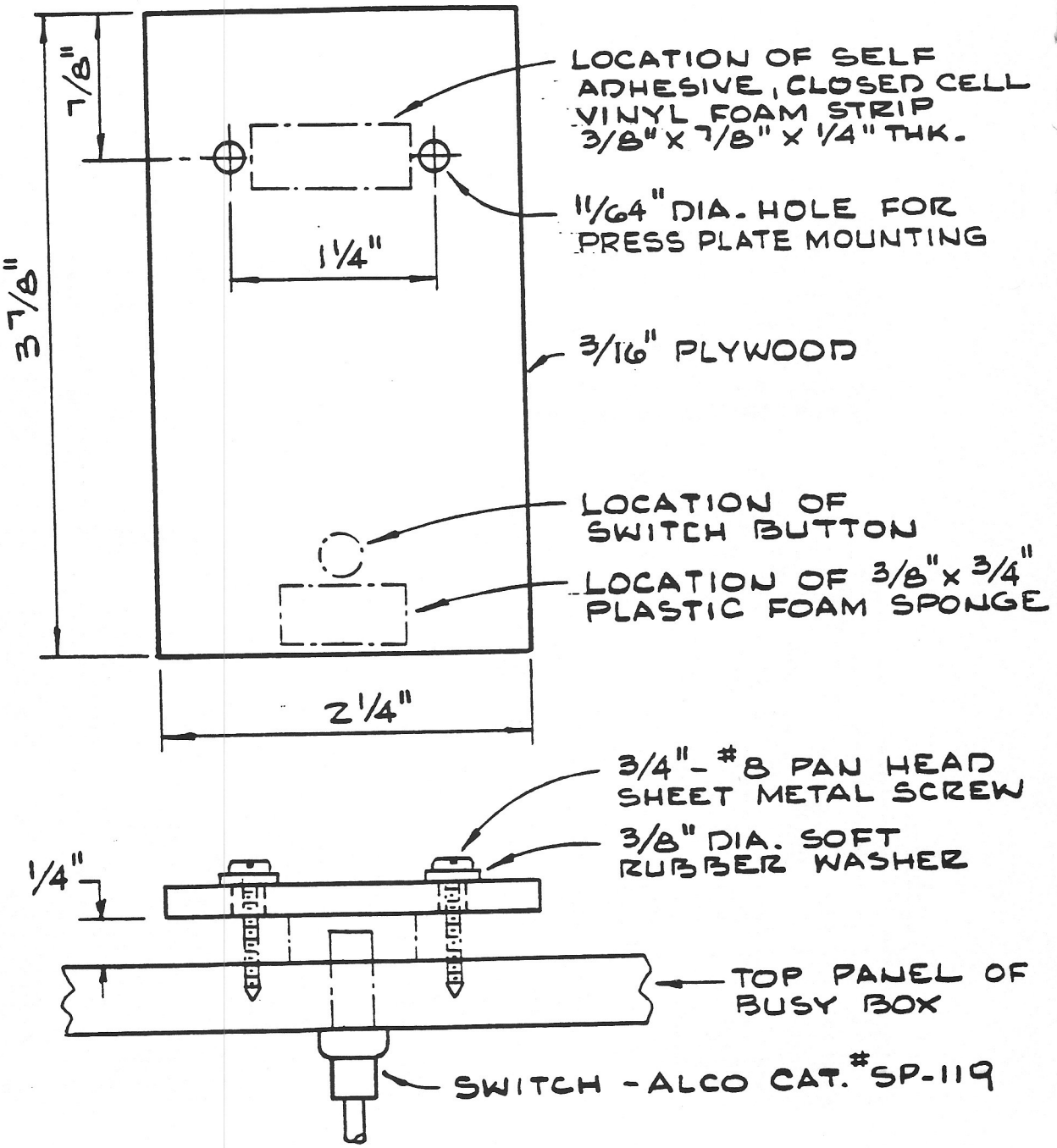
BUSY BOX


7/8"
3 7/8"
LOCATION OF SELF ADHESIVE, CLOSED CELL VINYL FOAM STRIP 3/8" X 7/8" X 1/4" THK.
11/64" DIA. HOLE FOR PRESS PLATE MOUNTING
1 1/4"
3/16" PLYWOOD
LOCATION OF SWITCH BUTTON
LOCATION OF 3/8" X 3/4" PLASTIC FOAM SPONGE
2 1/4"
3/4" - #8 PAN HEAD SHEET METAL SCREW
3/8" DIA. SOFT RUBBER WASHER
1/4"
TOP PANEL OF BUSY BOX
SWITCH - ALCO CAT. # SP-119

DETAIL OF PLYWOOD PRESS PLATE No. 1

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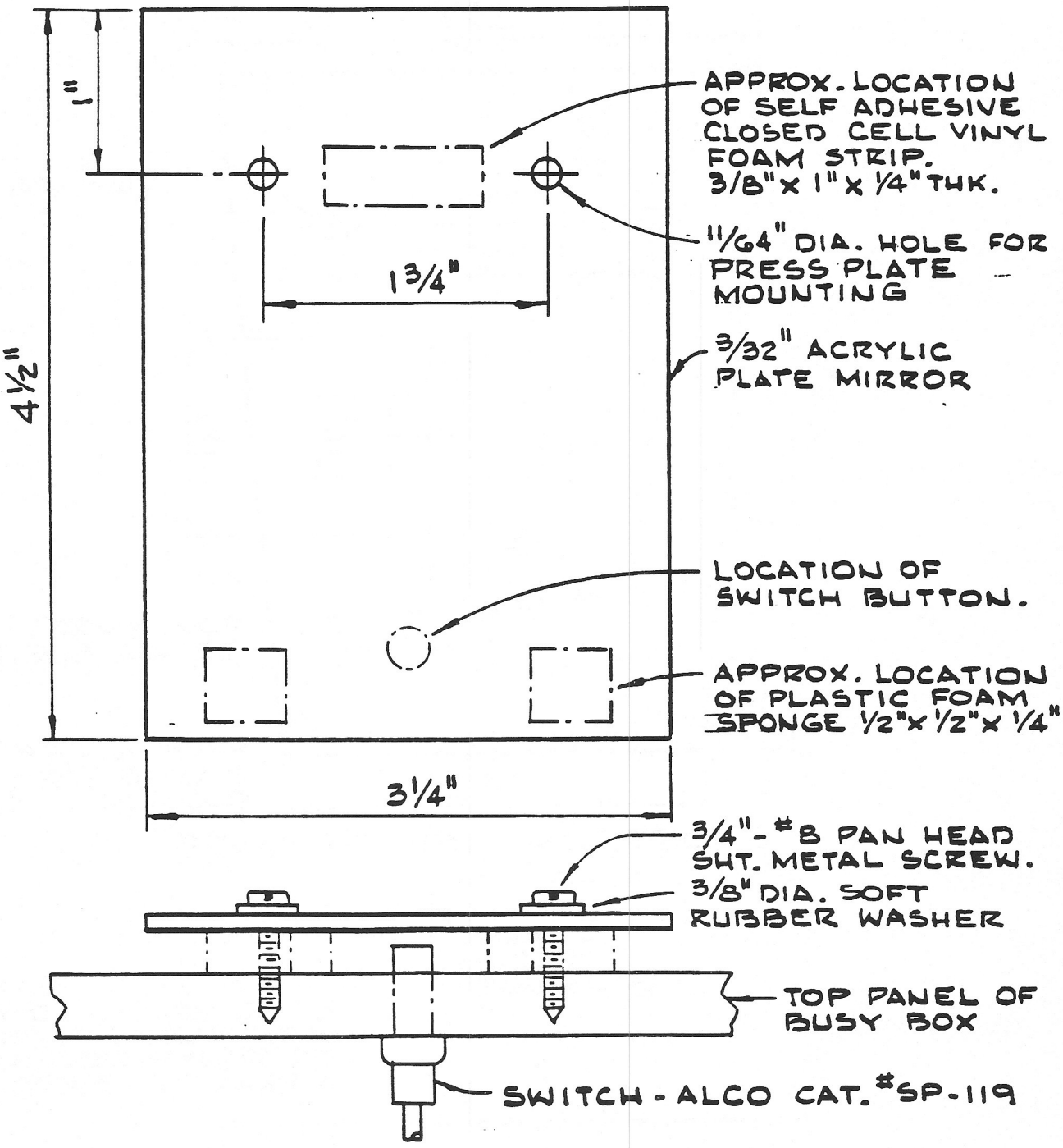
BUSY BOX


1"
4½"
APPROX. LOCATION OF SELF ADHESIVE CLOSED CELL VINYL FOAM STRIP. 3/8" x 1" x ¼" THK.
11/64" DIA. HOLE FOR PRESS PLATE MOUNTING
1 3/4"
3/32" ACRYLIC PLATE MIRROR
LOCATION OF SWITCH BUTTON.
APPROX. LOCATION OF PLASTIC FOAM SPONGE ½" x ½" x ¼"
3¼"
3/4" - #8 PAN HEAD SHT. METAL SCREW.
3/8" DIA. SOFT RUBBER WASHER
TOP PANEL OF BUSY BOX
SWITCH - ALCO CAT. #SP-119

DETAIL OF MIRROR PRESS PLATE No. 2

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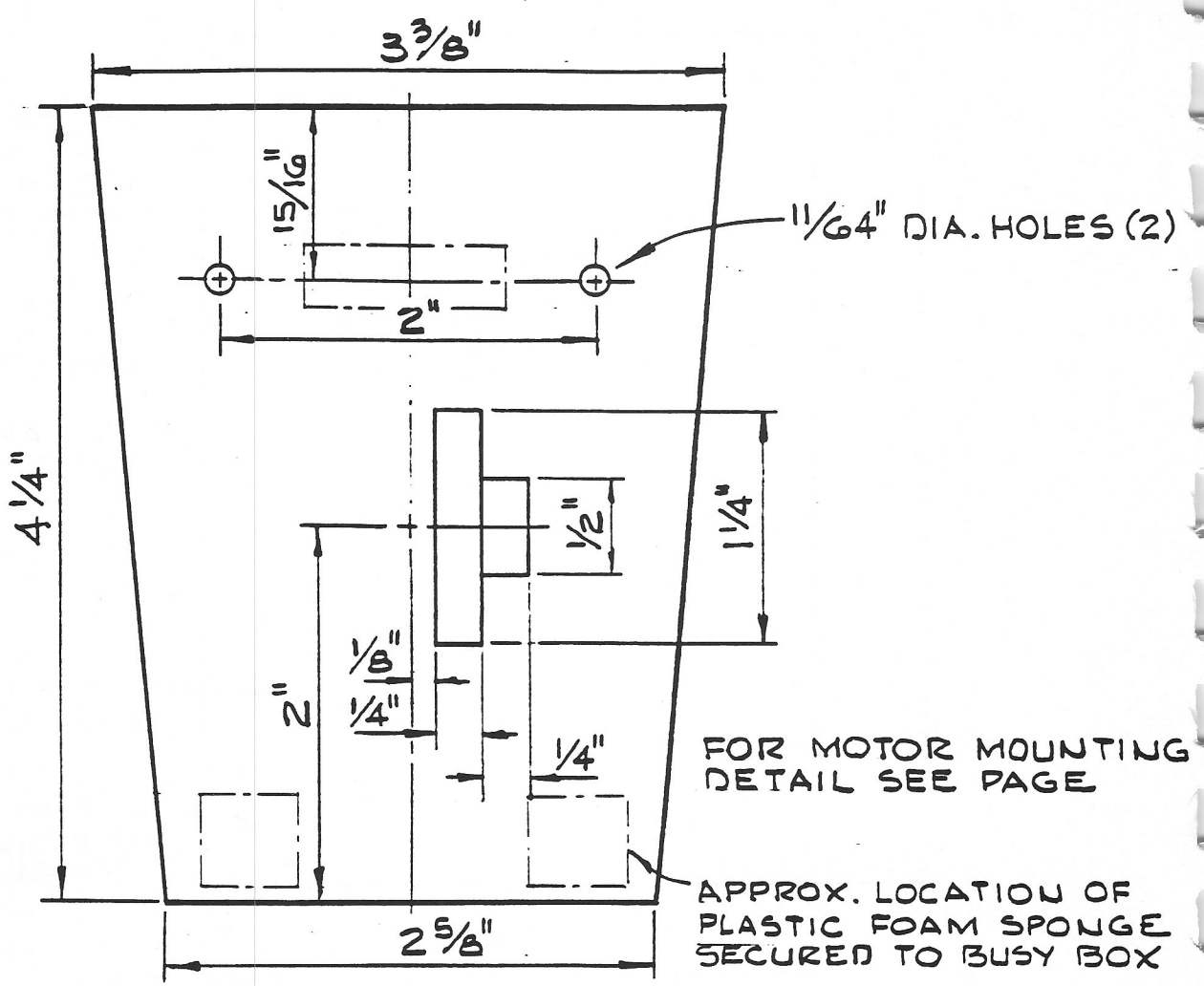
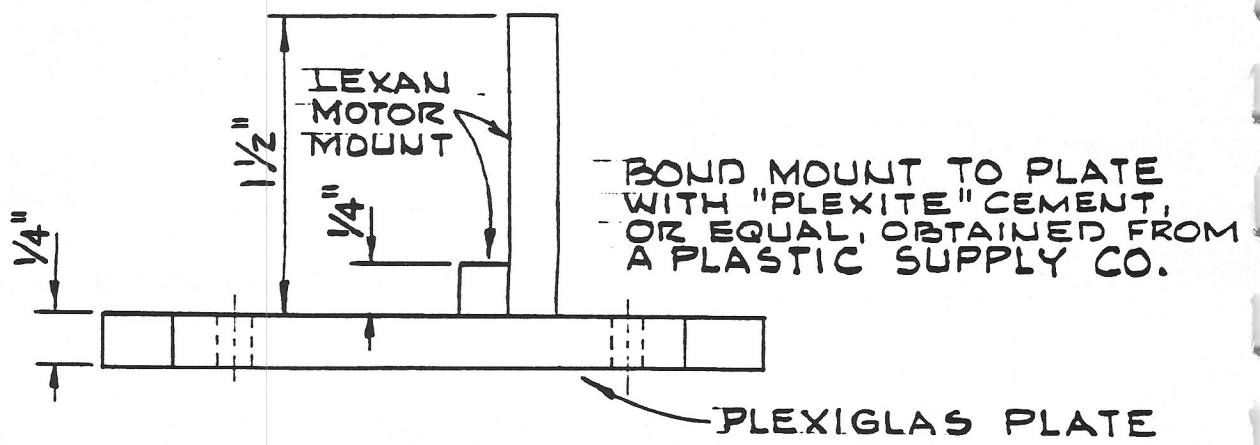
BUSY BOX



BOTTOM VIEW OF PLATE


LEXAN MOTOR MOUNT
1 1/2"
1/4"
1/4"
BOND MOUNT TO PLATE WITH "PLEXITE" CEMENT, OR EQUAL, OBTAINED FROM A PLASTIC SUPPLY CO.
PLEXIGLAS PLATE

MATERIALS: PLATE - PLEXIGLAS (COLOR OR OPAQUE)
MOTOR MOUNT - LEXAN

DETAIL OF PLEXIGLASS PRESS PLATE No.3

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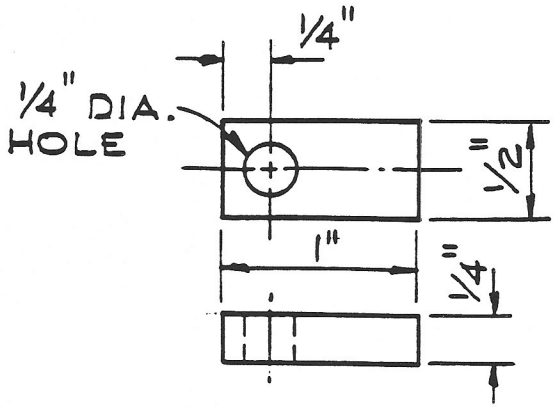
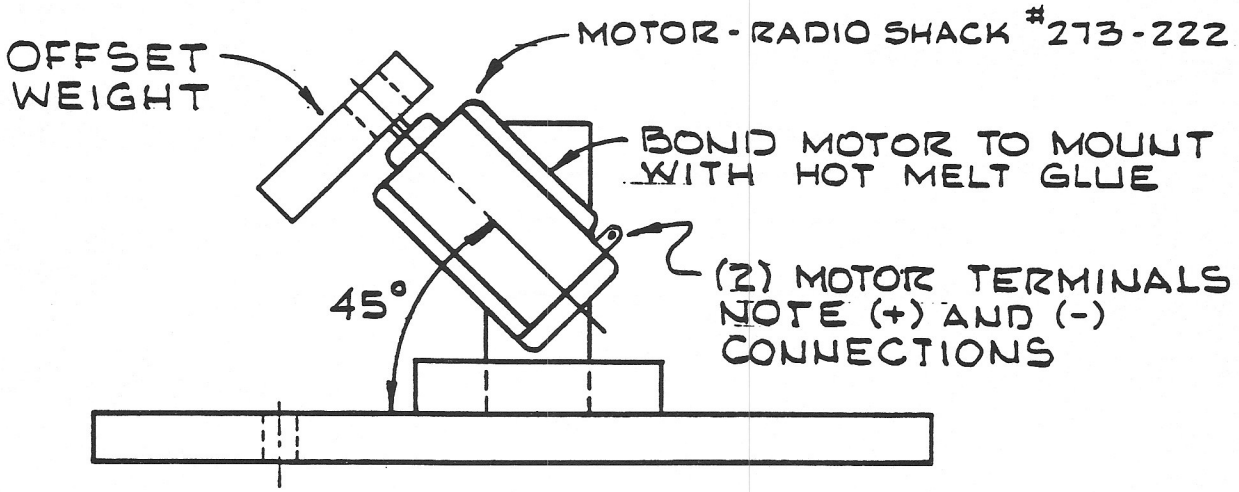
BUSY BOX



MATERIAL: 1/4" LEXAN (POLICARBONATE)

OFFSET WEIGHT

BOND TO SMALL GEAR ON MOTOR SHAFT WITH EPOXY GLUE



MOTOR MOUNTING DETAIL

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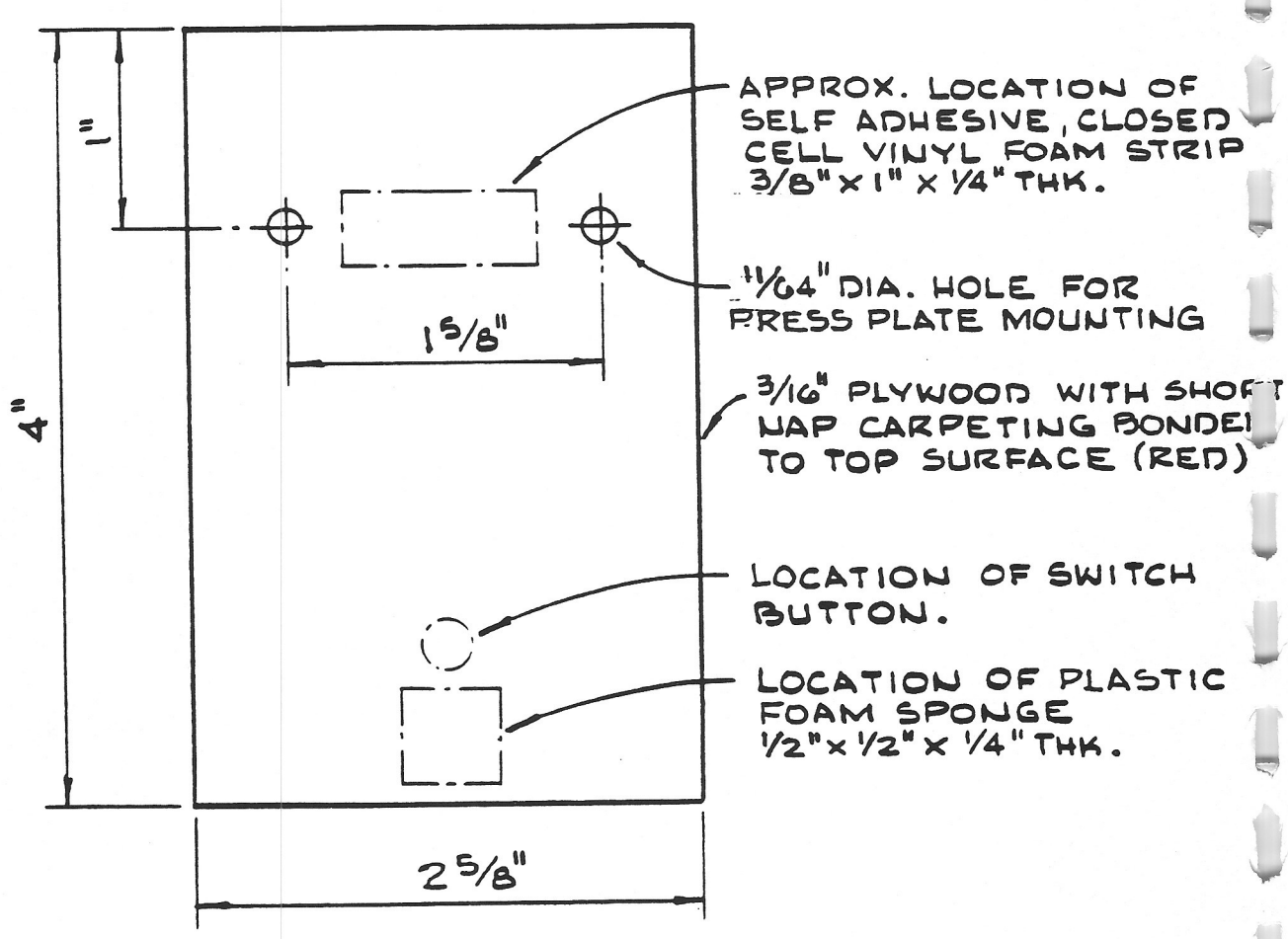
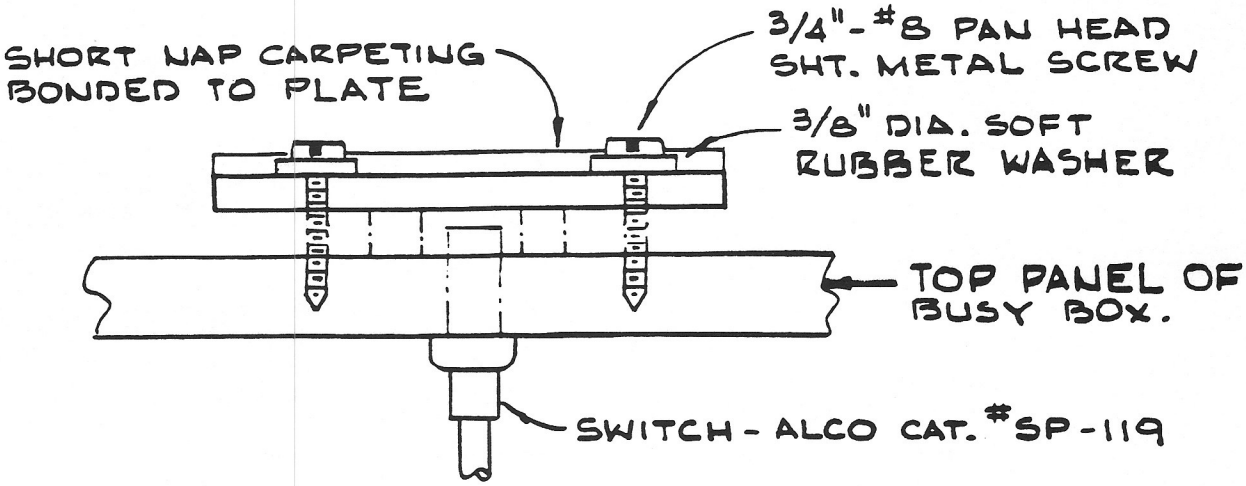
BUSY BOX


1"
4"
APPROX. LOCATION OF SELF ADHESIVE, CLOSED CELL VINYL FOAM STRIP 3/8" x 1" x 1/4" THK.
11/64" DIA. HOLE FOR PRESS PLATE MOUNTING
1 5/8"
3/16" PLYWOOD WITH SHORT NAP CARPETING BONDED TO TOP SURFACE (RED)
LOCATION OF SWITCH BUTTON.
LOCATION OF PLASTIC FOAM SPONGE 1/2" x 1/2" x 1/4" THK.
2 5/8"


SHORT NAP CARPETING BONDED TO PLATE
3/4" - #8 PAN HEAD SHT. METAL SCREW
3/8" DIA. SOFT RUBBER WASHER
TOP PANEL OF BUSY BOX.
SWITCH - ALCO CAT. # SP-119

DETAIL OF CARPET PRESS PLATE No. 4

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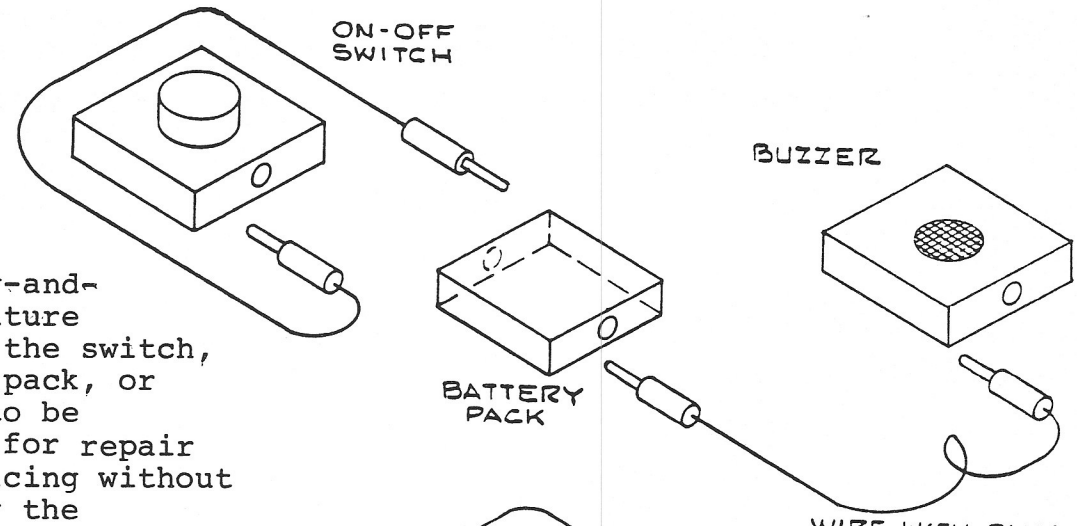
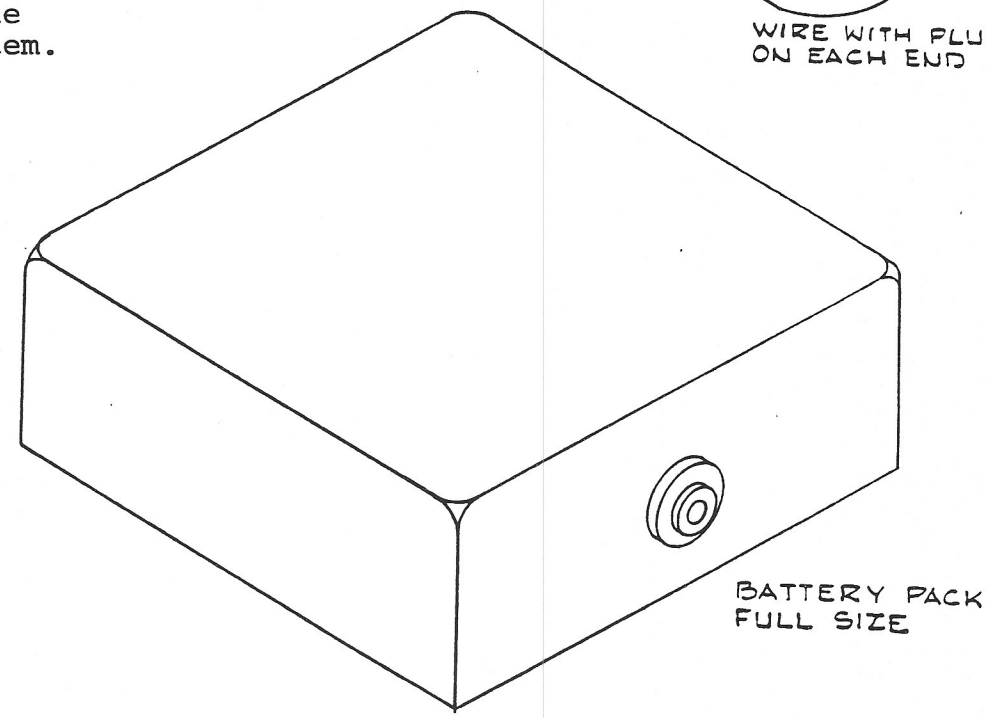
SIGNALING SYSTEM BATTERY PACK

This is a signaling system to be used by a Lekotek child in her room to alert a parent in an adjoining room. The system consists of an on/off switch with a jack, a connecting wire with a plug on each end, a 9-volt battery pack, another connecting wire with a plug on each end, and a buzzer with a jack.

This plan explains the system and details the battery pack. Use Plan #8 for making the on/off switch, Plan #9 for making the two connecting cords with plugs on each end, and Plan #10 for making the buzzer box.



The plug-and-jack feature permits the switch, battery pack, or buzzer to be removed for repair or servicing without removing the entire system.



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SIGNALING SYSTEM BATTERY PACK

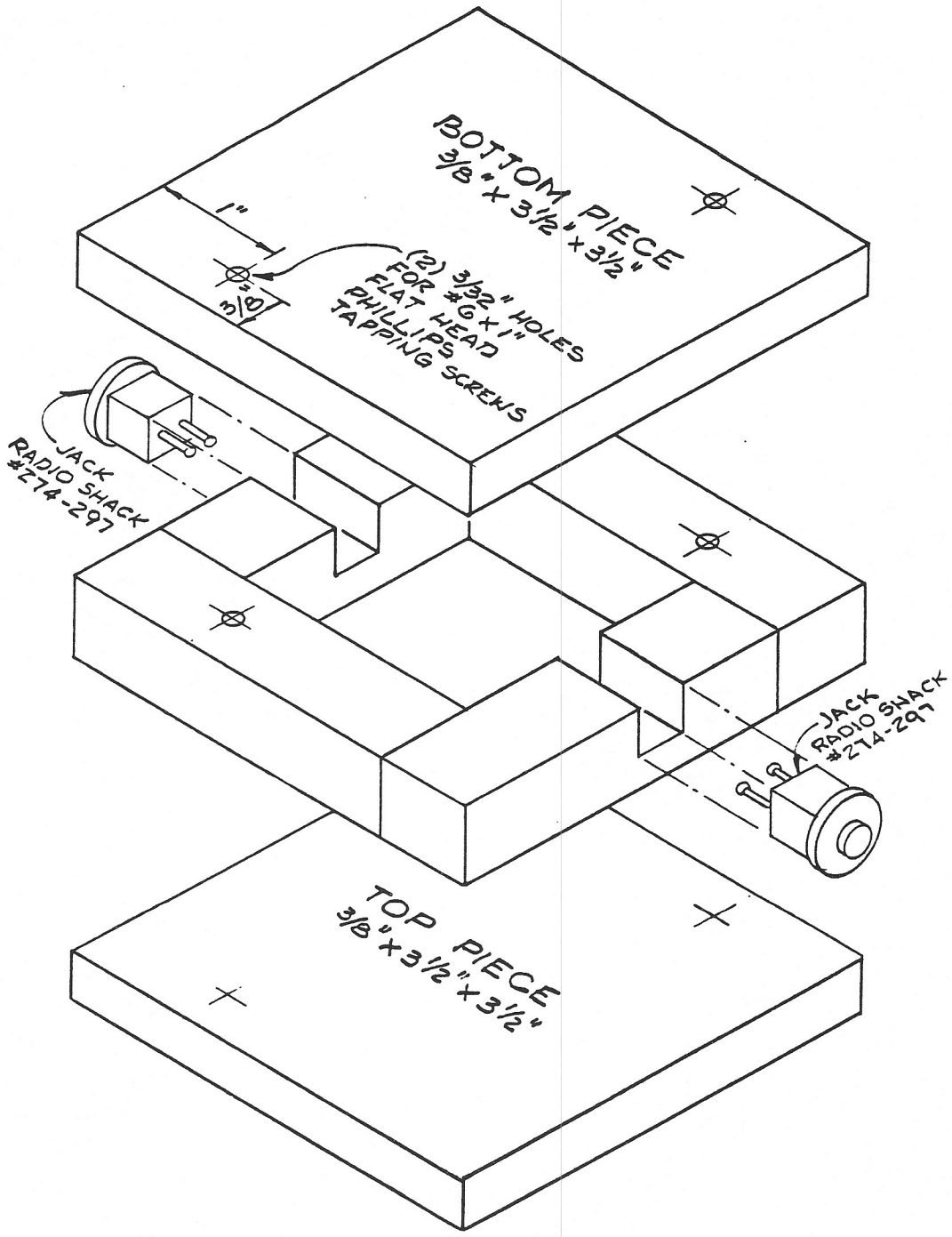
Materials needed:

- 2 pieces of wood: 3½" x 3½" x 3/8"
- 4 pieces of wood: 2-3/4" x 5/8" x 3/4"
- 2 jacks: Radio Shack #274-297
- #20 gauge wire: Radio Shack #278-1307
- 2 9-volt batteries
- 2 4-volt battery snaps (caps) #270-325
- 2 flat-head Phillips tapping screws: 1" x #6
- 4" x 4" x 3/16" sponge rubber, cut into pieces as described on drawing (to hold battery snug)
- Varathane or equivalent enamel in a bright color
- 1" x #17 wire brads
- Elmer's Carpenter Glue

Tools needed:

- Table saw
- Sander
- Fine sandpaper
- Small soldering iron
- Electric drill and set of drill bits
- Hammer
- Ruler
- Square
- Brush

SIGNALING SYSTEM BATTERY PACK



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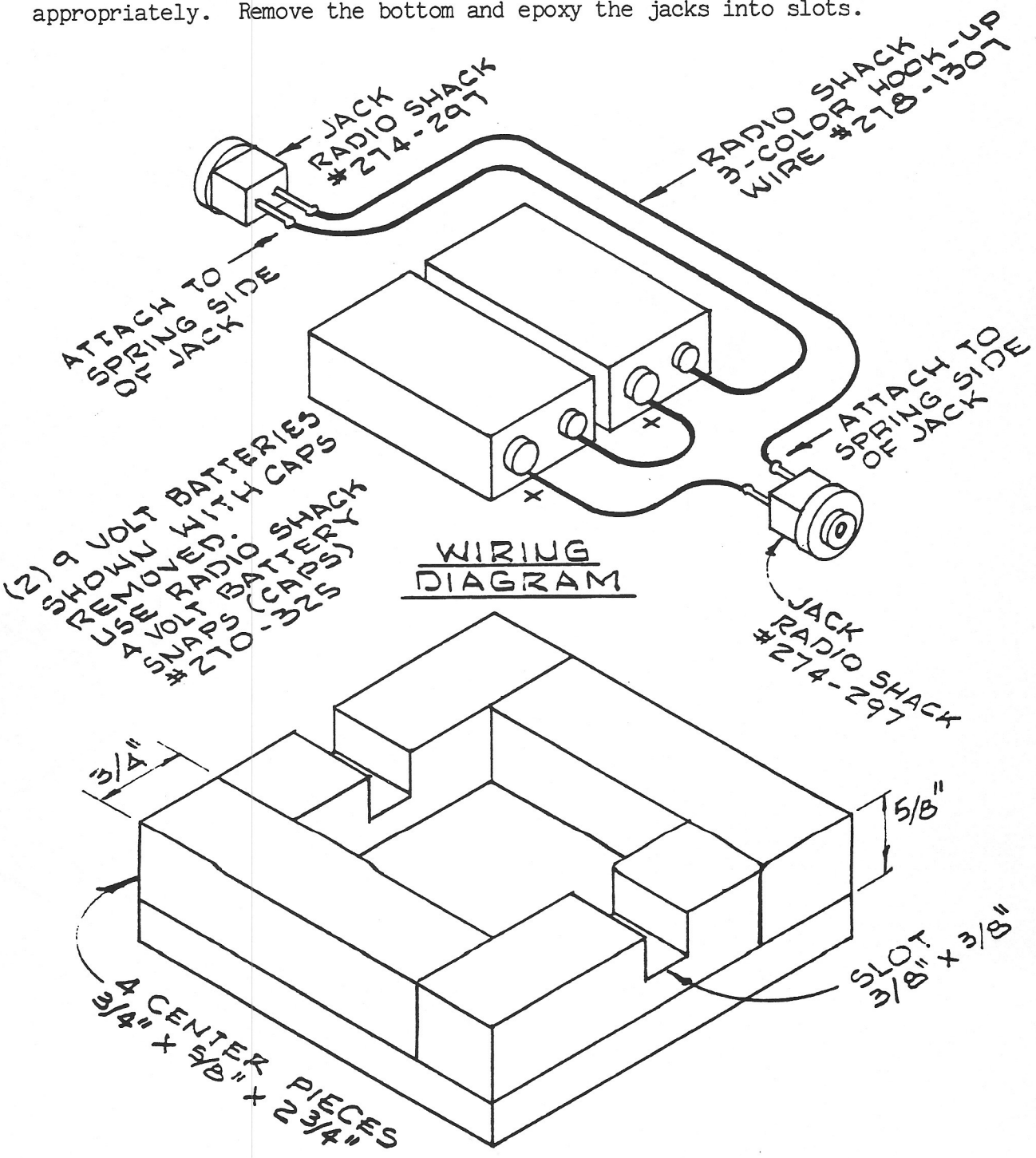
SIGNALING SYSTEM BATTERY PACK

Cut four center pieces to size. Apply glue and use ½" x 16 brads to assemble on top piece. Saw 3/8" x 3/8" slots centered between the sides. Drill holes for the screws and screw the bottom in place. Sand overall and round the corners. Paint appropriately. Remove the bottom and epoxy the jacks into slots.


JACK RADIO SHACK #274-297
RADIO SHACK 3-COLOR HOOK-UP WIRE #278-1307
ATTACH TO SPRING SIDE OF JACK
(2) 9 VOLT BATTERIES SHOWN WITH CAPS REMOVED. USE RADIO SHACK 9 VOLT BATTERY SNAPS (CAPS) #270-325
+
-
ATTACH TO SPRING SIDE OF JACK
WIRING DIAGRAM
JACK RADIO SHACK #274-297
3/4"
5/8"
SLOT 3/8" x 3/8"
4 CENTER PIECES 3/4" x 5/8" x 2 3/4"

With the jacks in place, solder the wires to the leads in the jacks as shown. Cut 1/8" or 3/16" thick sponge rubber into one piece 3/4" x 2" and one piece 2" x 2" and use these to snug the 2 wired batteries into place in the hollow of the battery pack box. Screw on the bottom piece.

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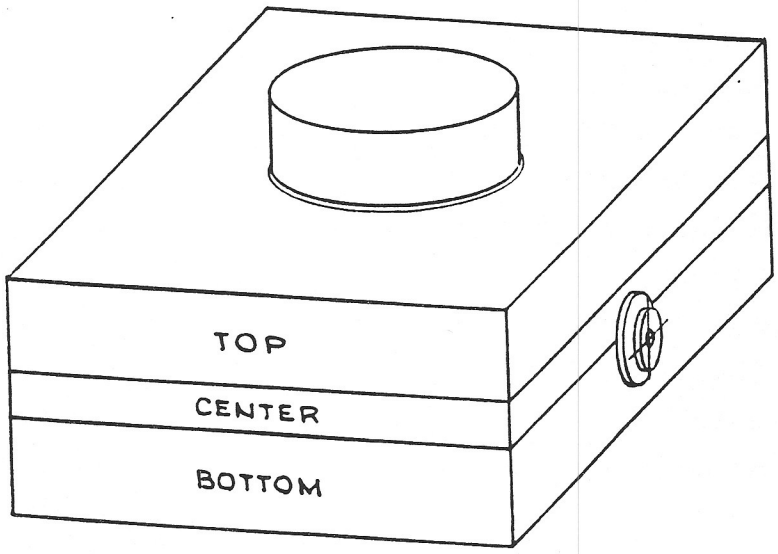
PUSH-BUTTON SWITCH FOR REMOTE OPERATION

This is a switch with a large push-button. It is used with a connecting cord that has a plug on each end (Lekotek Plan #9). One plug is pushed into the jack on one side of the switch box; the other is pushed into the jack of a battery-operated toy, tape player, etc. It is also used as part of the signaling system in Lekotek Plan #7.

The switch uses the protective plastic top from a pressure can of spray paint or shaving cream. Either size top may be used. The holes in the top and center pieces are cut to provide a slightly loose fit for whichever size top is used. These holes are cut with an adjustable circle cutter (Stanley tools).

When assembled for use, the plastic top sits on the switch held upright by an "S" bracket. The top is guided up and down by the holes in the top and center pieces. The height of the "S" bracket permits the switch to be completely activated and also permits the cap to reach the bottom before putting strain on the switch. In use, the switch will absorb quite a bit of slamming and banging.



Before final assembly, the switch box should be painted a bright color contrasting with the color of the plastic cap. Lead-free paints should be used.

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PUSH-BUTTON SWITCH FOR REMOTE OPERATION

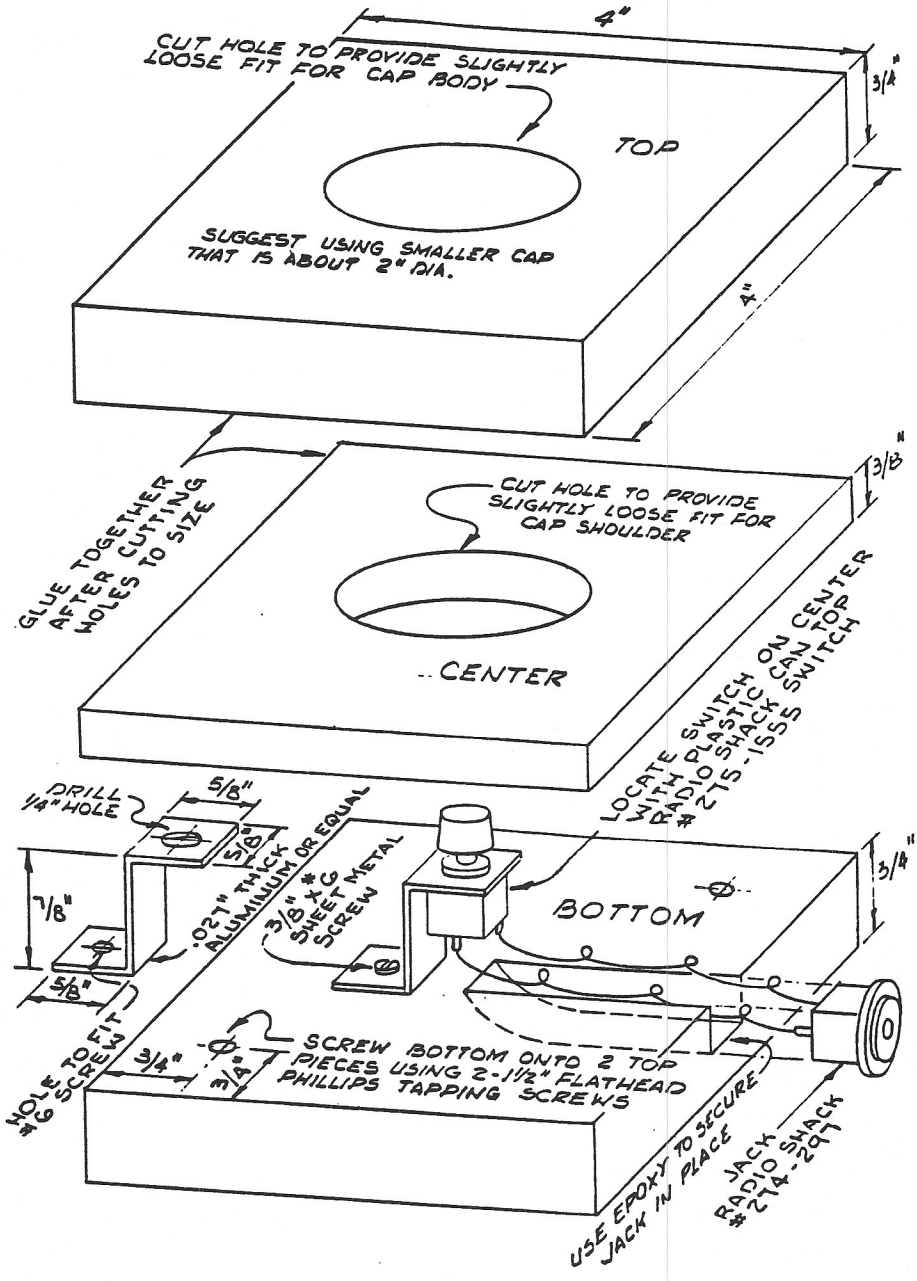
Materials needed:

- Protective plastic top from pressure can of paint or shaving cream, etc.
- 2 pieces of wood: 4" x 4" x 3/4"
- 1 piece of wood: 4" x 4" x 3/8"
- 2 flat-head Phillips tapping screws: 1½" x #6
- Jack: Radio Shack #274-297
- Switch: Radio Shack #275-1555
- Piece of aluminum .027" thick or equivalent; size 2½" x 5/8"
- 1 sheet metal screw: 3/8" x #6
- #20 gauge wire: Radio Shack #278-1307
- Epoxy glue
- Varathane or equivalent enamel in a bright color
- Rosin core solder

Tools needed:

- Table saw
- Sander
- Small soldering iron
- Set of drill bits
- Adjustable circle cutter
- Hammer
- Ruler
- Square
- Brush
- Screwdriver

PUSH-BUTTON SWITCH FOR REMOTE OPERATION


4"
CUT HOLE TO PROVIDE SLIGHTLY LOOSE FIT FOR CAP BODY
TOP
3/4"
SUGGEST USING SMALLER CAP THAT IS ABOUT 2" DIA.
4"
GLUE TOGETHER AFTER CUTTING HOLES TO SIZE
3/8"
CUT HOLE TO PROVIDE SLIGHTLY LOOSE FIT FOR CAP SHOULDER
CENTER
LOCATE SWITCH ON CENTER WITH PLASTIC CAP FOR RADIO SHACK SWITCH #275-1555
DRILL 1/4" HOLE
5/8"
3/8"
7/8"
5/8"
.027" THICK ALUMINUM OR EQUAL
3/8" #6 SHEET METAL SCREW
BOTTOM
3/4"
SCREW BOTTOM ONTO 2 TOP PIECES USING 2-1 1/2" FLATHEAD PHILLIPS TAPPING SCREWS
3/4"
3/4"
DRILL HOLE TO FIT #6 SCREW
USE EPOXY TO SECURE JACK IN PLACE
JACK RADIO SHACK #274-297

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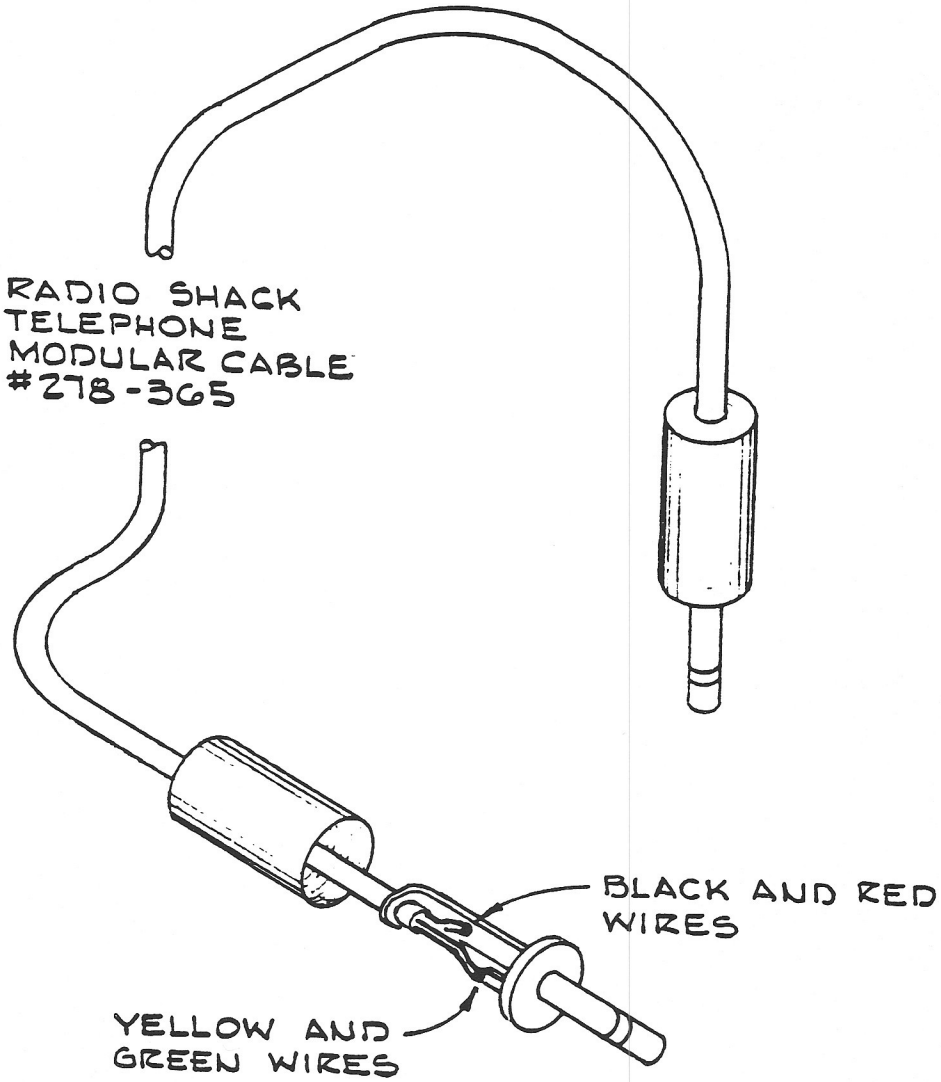
CONNECTING CORD WITH PLUG ON EACH END

This is a connecting cord used with a switch to permit remote operation of battery-operated toys, tape recorders, etc. For most uses, an eight-foot length of cord is sufficient. The plug is standardized, as is the jack that it is used with. This permits it to be plugged into any Lekotek battery-operated, remote-controlled unit.



SOLDER THE CONNECTIONS

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CONNECTING CORD WITH PLUG ON EACH END

Materials needed:

- 8 feet telephone modular cable: Radio Shack #278-365
- 2 plugs: Radio Shack #274-286
- Rosin core solder

Tools needed:

- Small soldering iron
- Ruler
- Pliers

REMOTELY CONTROLLED BUZZER

This is the buzzer part of the signaling system described in Plan #7 to be used by a Lekotek child to alert a parent in an adjoining room. The child presses an on/off switch in her room, and with connecting wires and a battery pack, a buzzer sounds in the parent's room. The battery pack is described in Plan #7, the switch in Plan #8, and the connecting wires with plugs in Plan #9.

On page 2 are shown the three separate wooden pieces that make up the buzzer box. The holes are cut with an adjustable circle cutter (Stanley tool) to the diameters shown.

First assemble the prepared wooden pieces with the screws. Sand the box overall and paint it a bright color. Disassemble when dry, install screen, jack, and buzzer, then screw together. With the other components of the system installed in the home, the child can call and be heard.

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REMOTELY CONTROLLED BUZZER

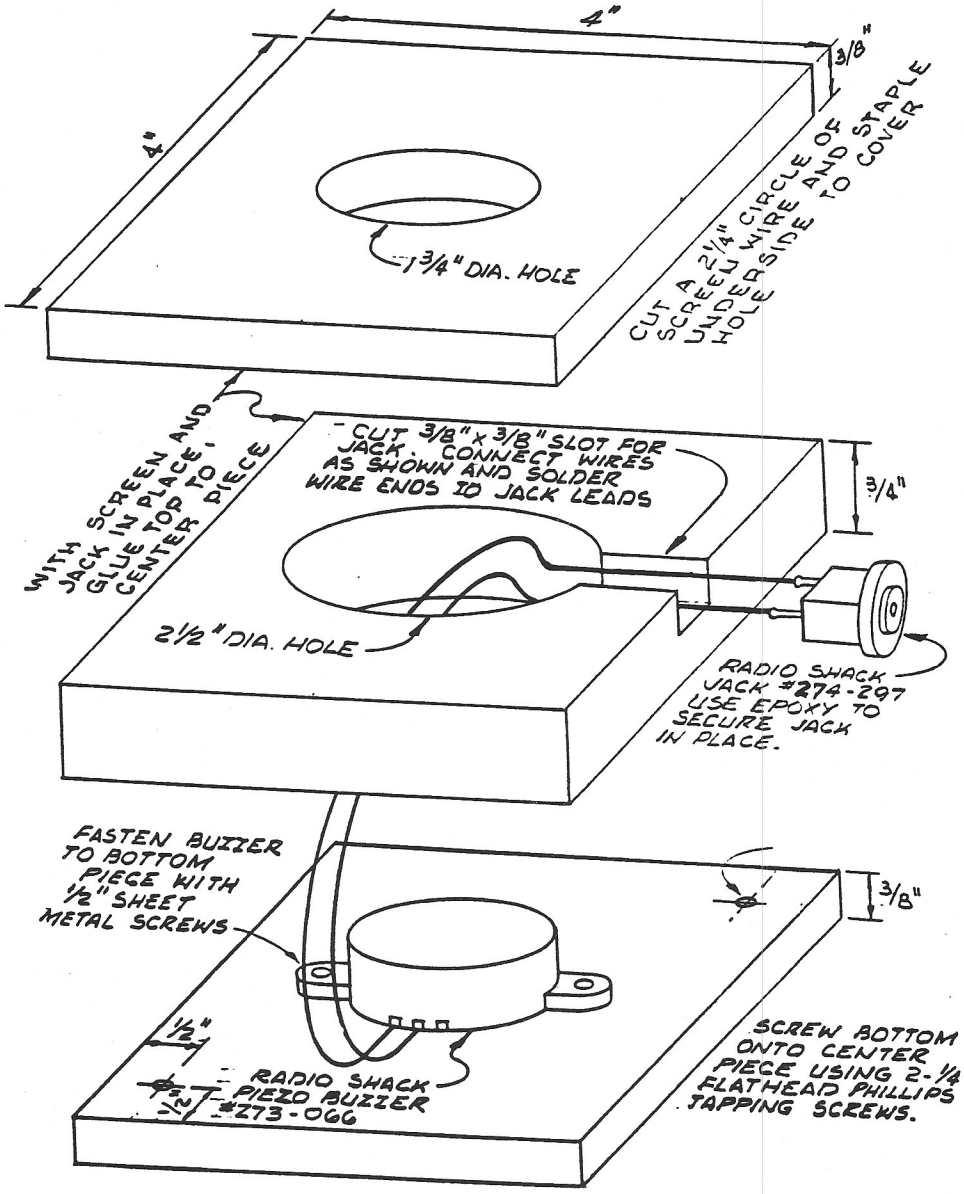
Materials needed:

- 2 pieces of wood: 4" x 4" x 3/8"
- 1 piece of wood: 4" x 4" x 3/4"
- 16-mesh screen; metal, not plastic: 2½" x 2½"
- 8 small staples
- 20-gauge wire; Radio Shack #278-1307
- Jack: Radio Shack #274-297
- Piezo buzzer: Radio Shack #273-066
- 2 sheet metal screws: 1/2" x #6
- 2 #6 Phillips tapping screws: 2¼" x #6
- Varathane enamel or equivalent in a bright color
- Rosin core solder

Tools needed:

- Table saw
- Sander
- Electric drill and set of drill bits
- Adjustable circle cutter

REMOTELY CONTROLLED BUZZER


4"
4"
3/8"
1 3/4" DIA. HOLE
CUT A 2 1/4" CIRCLE OF SCREEN WIRE AND STAPLE UNDER HOLE SIDE TO COVER
WITH SCREEN AND JACK IN PLACE, GLUE TOP TO CENTER PIECE
CUT 3/8" x 3/8" SLOT FOR JACK. CONNECT WIRES AS SHOWN AND SOLDER WIRE ENDS TO JACK LEADS
3/4"
2 1/2" DIA. HOLE
RADIO SHACK JACK #274-297 USE EPOXY TO SECURE JACK IN PLACE.
FASTEN BUZZER TO BOTTOM PIECE WITH 1/2" SHEET METAL SCREWS
3/8"
1/2"
RADIO SHACK PIEZO BUZZER #273-066
SCREW BOTTOM ONTO CENTER PIECE USING 2-1/4" FLATHEAD PHILLIPS TAPPING SCREWS.

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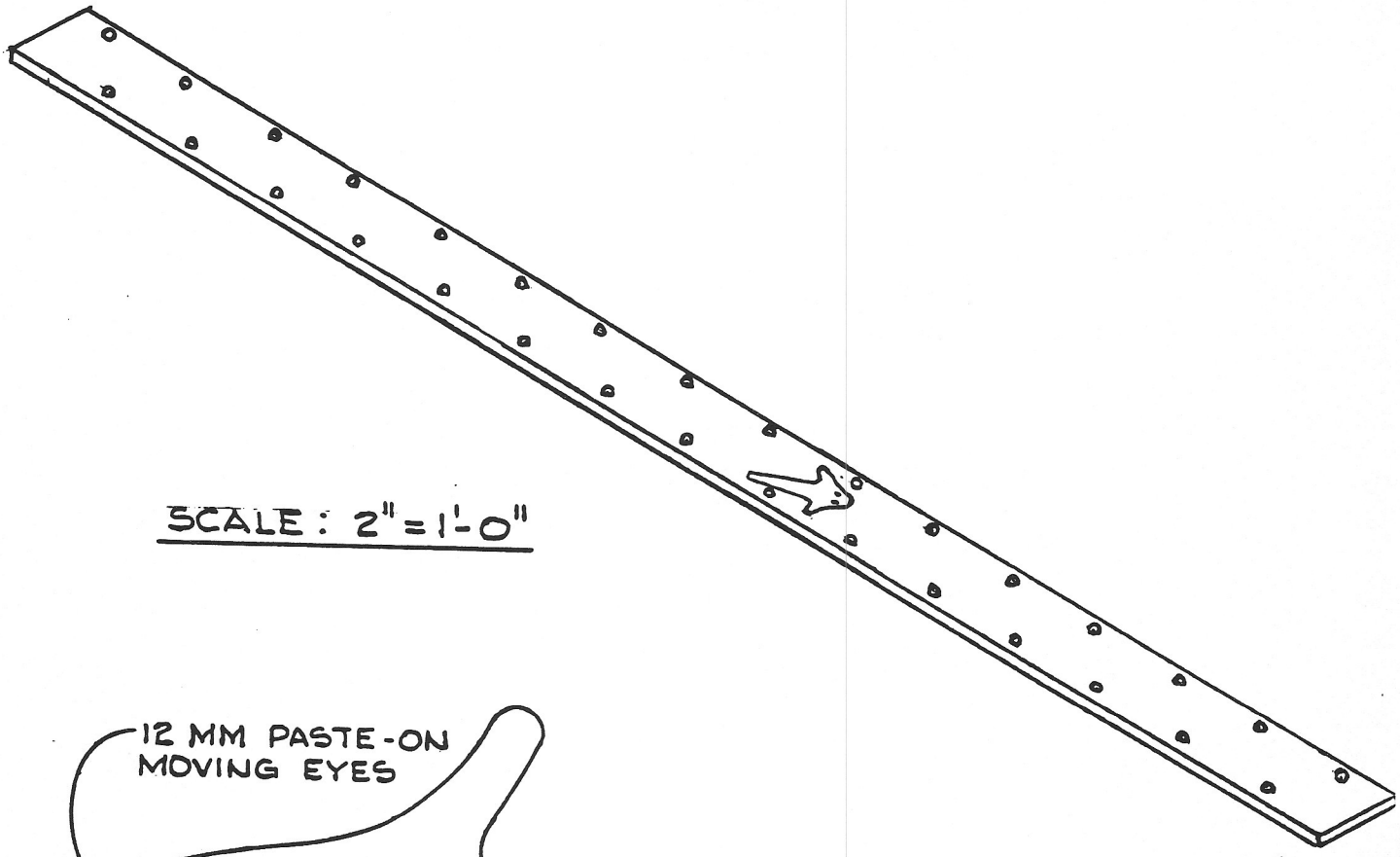
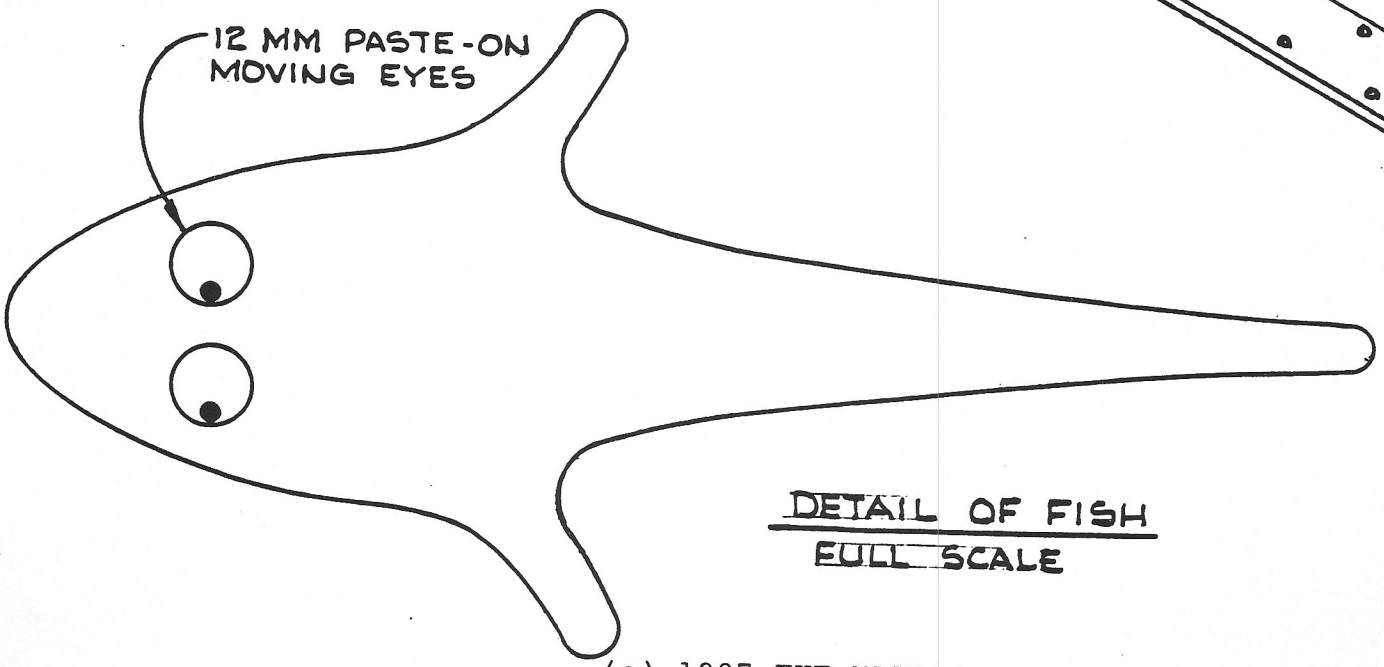
FISH WIGGLER TRACKING TOY

This is a toy that combines attention-keeping with eye-tracking and physical activity. It is made of rather common materials and requires no special tools. It requires no winding up or batteries. The four-foot slide board is placed on a slope and the fish is put on the high end. As the fish slides down, the two rows of pegs cause it to wiggle back and forth. The greater the slide slope, the more vigorous is the wiggle.



SCALE: 2" = 1'-0"



DETAIL OF FISH
FULL SCALE

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FISH WIGGLER TRACKING TOY

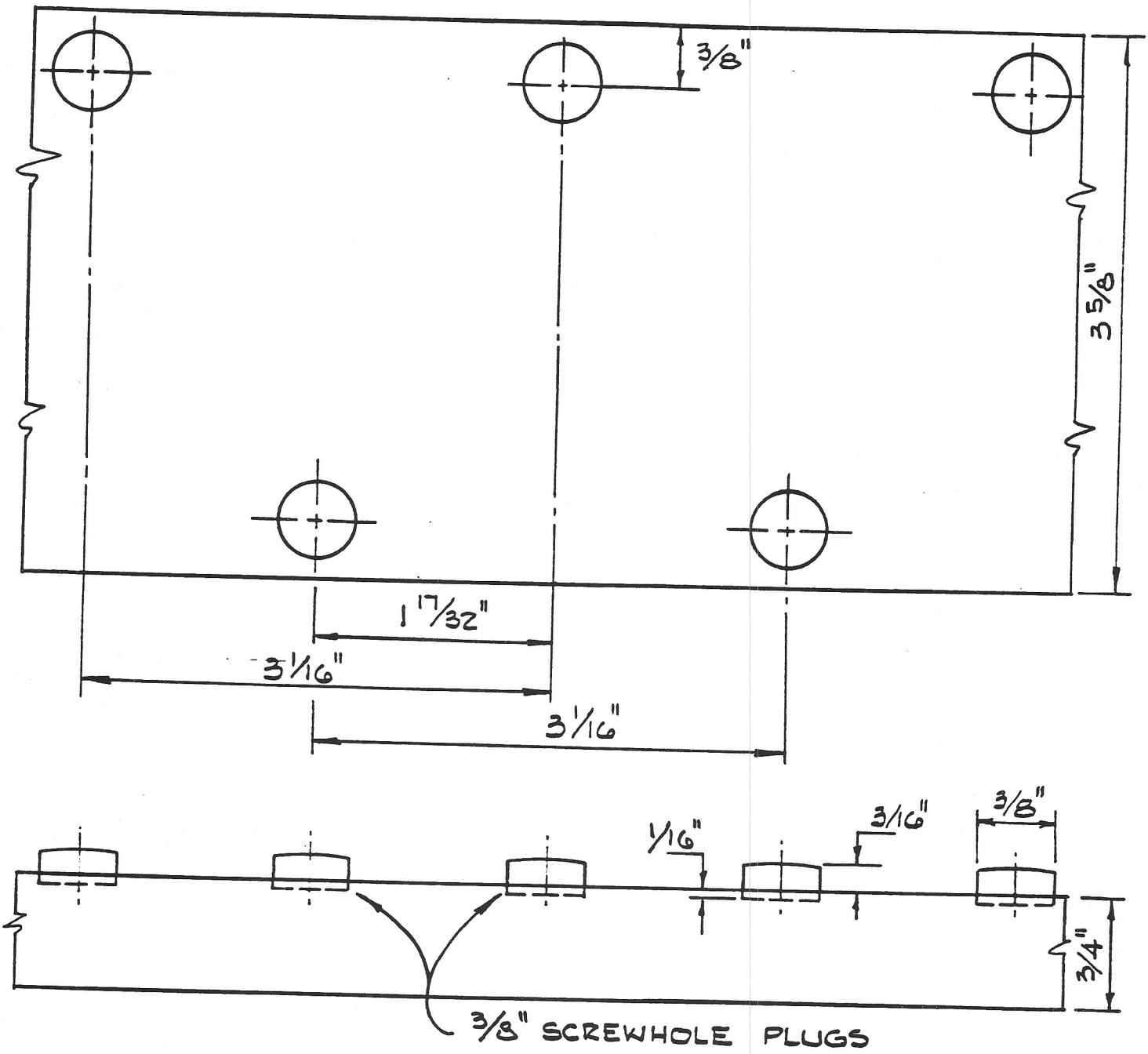
Materials needed for three slides:

- 1" x 10" x 4' clear grade birch or maple
- 12" x 12" x 1/4" tempered Masonite
- 100 screwhole plugs, 3/8" diameter
- Varathane or equivalent enamel in two bright colors
- Package of approximately 20 movable eyes, 12MM in diameter
- Silicone spray
- Elmer's Carpenter Glue

Tools needed:

- Table saw
- Electric drill and set of drill bits
- Sander
- Ruler
- Fine sandpaper
- Powered jigsaw or hand coping saw

FISH WIGGLER TRACKING TOY



DETAIL OF SLIDE BOARD AND SCREWHOLE PLUGS
FULL SCALE

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FISH WIGGLER TRACKING TOY

CONSTRUCTION SUGGESTIONS

The only material requirement for the slide board is that the wood be flat and straight. Cabinet-grade birch or maple is preferred. Any width that will result in a minimum of scrap will do. For instance, a piece of 1" x 10" x 4' will give you three slides.

A well-stocked hardware store or lumber yard should carry screwhole plugs. Use 3/8" diameter plugs and get 31 plugs per slide. If screwhole plugs are not obtainable, they can be made from 3/8" dowel stock, but it takes time to round an end, cut it off to length, round an end, cut it to length, etc.

Locate the holes for the screwhole plugs with care. Using a 3/8" brad-point bit or a regular 3/8" wood bit, drill 1/16" holes. Carefully sand the slide. Then glue a screw-hole plug into each hole.

Trace the outline of the fish onto 1/4" tempered Masonite. Use care to assure that the finished fish is of the same contours as the drawn fish. Sand the fish carefully to smooth the edges and the bottom.

Paint the slide, top and bottom, and the pegs in a bright color. Paint the fish a bright contrasting color. Use two coats of paint, sanding between coats and upon completion.

The 12MM paste-on moving eyes are obtained from an arts and crafts store.

Glue on the eyes. Give the slide and the bottom of the fish a light spray of silicone.

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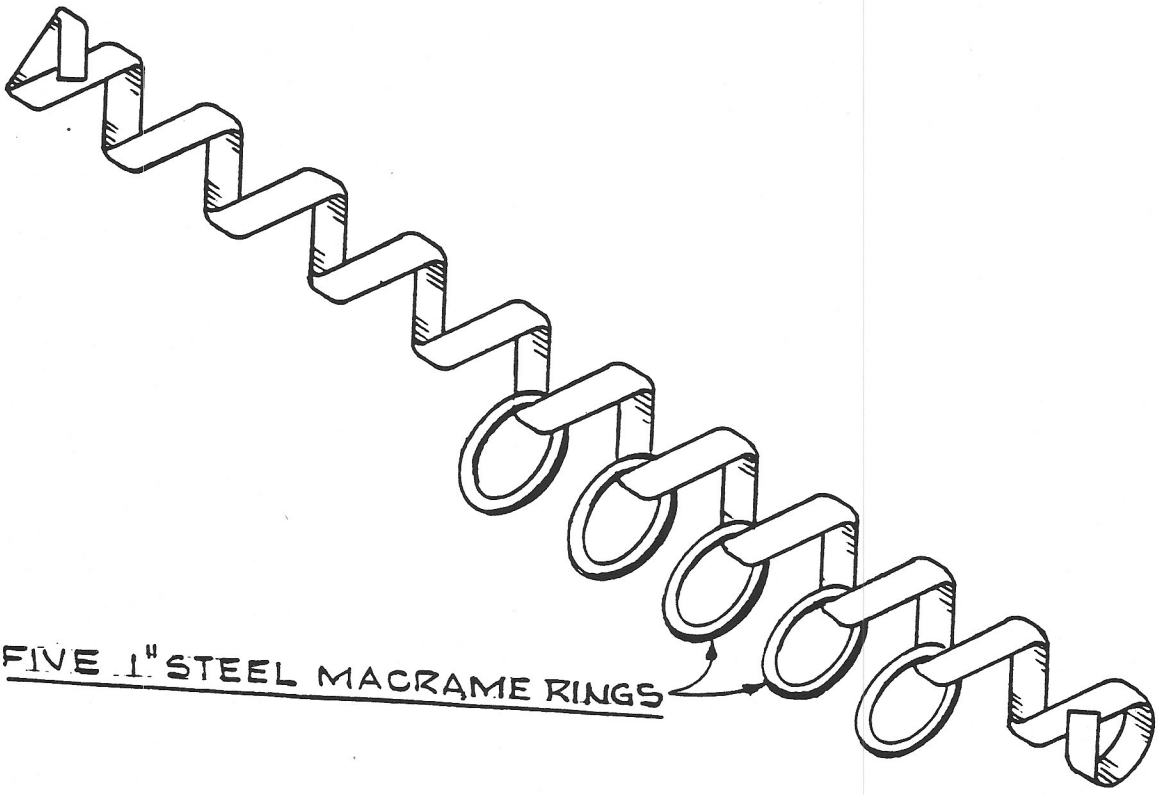
CORKSCREW TRACKING TOY

It's hard to find toys that require vertical tracking. The corkscrew is great for this. Additionally, it is good for wrist rotation and for using two hands, as the child turns the toy over to start again.



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CORKSCREW TRACKING TOY

Materials needed for approximately 20 toys:

- Colored "Kydex," 24" x 36" x .125"
- 100 steel macrame rings, 1" in diameter
- 14" x 3/4" dowel rod

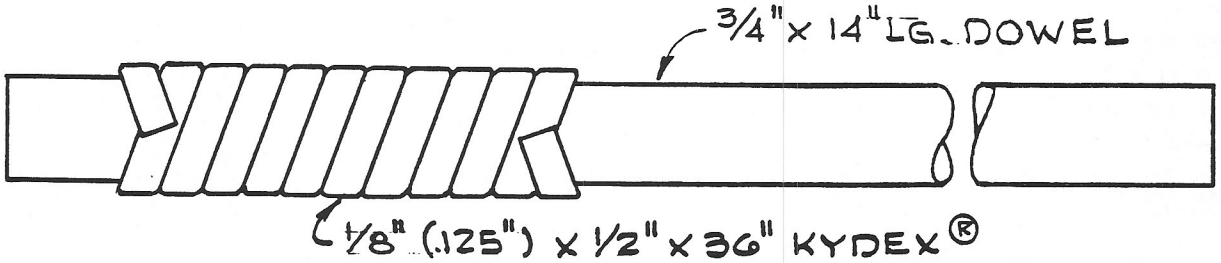
Tools needed:

- Leather gloves
- Pliers
- Cookie sheet
- Kitchen stove oven

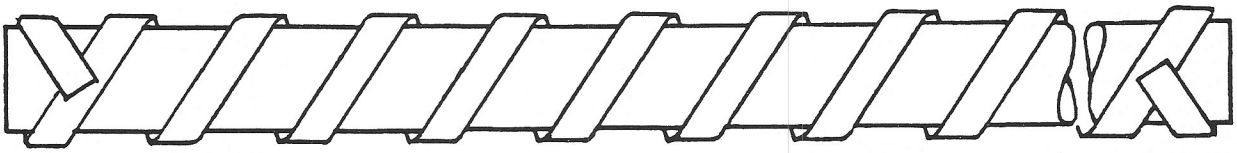
CORKSCREW TRACKING TOY

CONSTRUCTION SUGGESTIONS

Buy a 36" x 24" x .125" piece of bright yellow, red, or cadet blue Kydex from the Cadillac Plastic Co. nearest you. (See addresses on page 4 of this plan.) Cut strips 36" long and 1/2" wide from the Kydex; carefully sand the edges and round the edge corners. Get a dowel rod 3/4" in diameter and 14" long and a pair of gloves. Set the oven at 360 degrees and put in a large cookie sheet.



Bend a strip of Kydex and put it in the oven. In 1½ minutes the strip will be as limp as a cooked noodle. Using gloves, remove the strip and wrap it around the dowel tightly, making sure to lap the ends as shown above. If you work too slowly, the Kydex will stiffen and become unworkable. If this happens, remove it from the dowel and put it back in the oven for 1½ minutes, and start over.



Place the Kydex-wrapped dowel back in the oven for 30 seconds. Remove the dowel from the oven and, using the gloves, stretch the Kydex evenly to the full length of the dowel as shown above. It will be stiff and reasonably cool within a minute of being removed from the oven. When it is cool, slip it off the dowel and repeat the entire operation with another strip of Kydex.

You may need someone to help you slip the macrame rings on as you hold the overlapping end open. Put on five rings for a colorful and noisy cascade down the corkscrew. When they are all down, invert the corkscrew for a repeat cascade. Remember, there is no spring to wind or batteries to replace.

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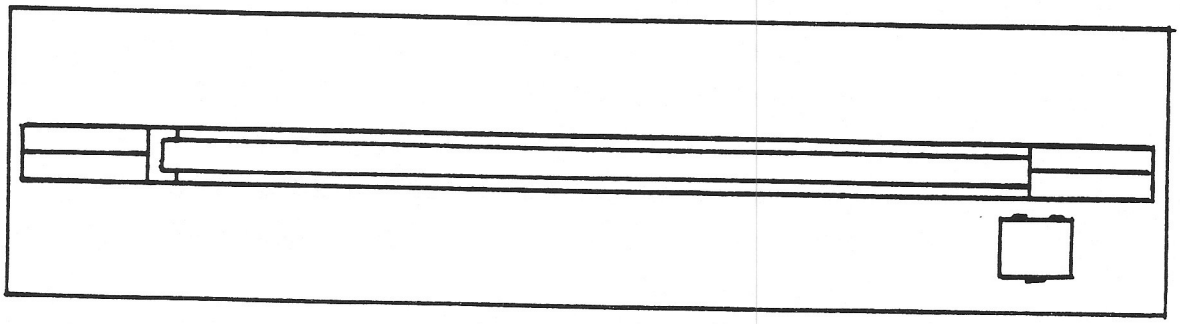
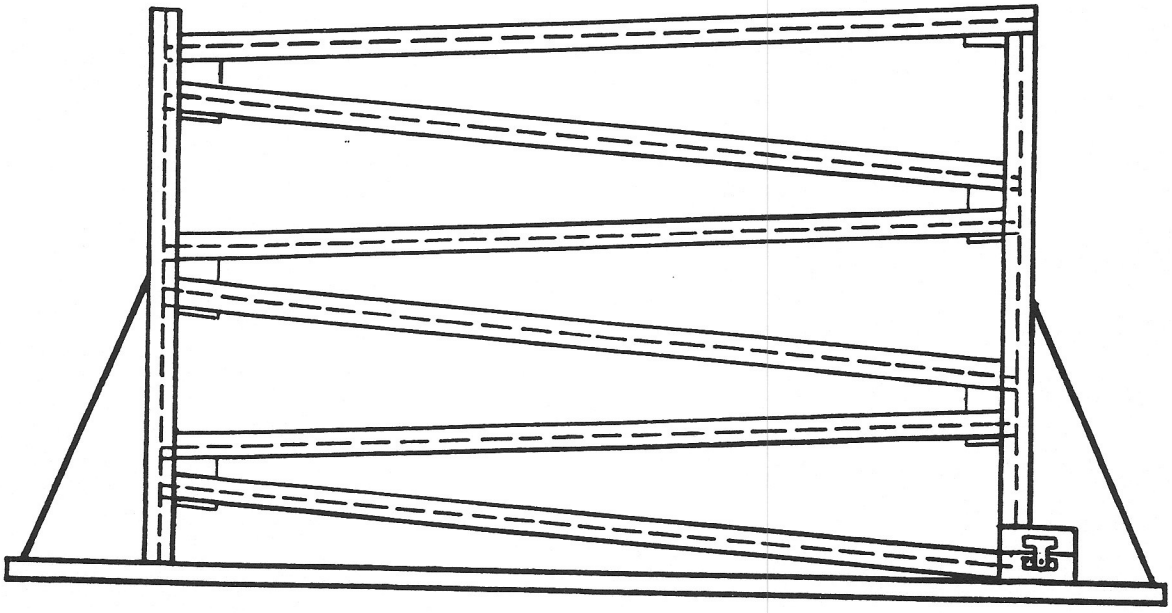
BALL ROLL TRACKING TOY

This large toy is great for tracking. The shiny steel ball rolls down the ramps slowly enough for the child to watch its progress. It's also fun to anticipate the movement of the ball by blocking a ramp with a hand or finger.



TOP VIEW



FRONT VIEW

Considerable detail is given in text and drawing to simplify construction. A table saw and sander are required, and a drill press would be handy. It makes sense to make four or eight of these toys at one time.

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BALL ROLL TRACKING TOY

Materials needed for four toys:

- 20 linear feet of 1" x 8" clear wood, either sugar pine, mahogany, maple, or other. Buy in lengths or multiples of 2 feet in length
- One piece birch plywood: 33" x 32" x 1/2"
- One piece birch plywood: 12" x 18" x 1/4"
- One piece fir plywood: 23-3/8" x 18" x 1/2"
- One piece scrap wood: 28-3/8" x 1" x 3/4"
- Two pieces scrap wood: 18" x 2" x 3/4"
- Four chrome-plated steel ball bearings: 1" in diameter
- Elmer's Carpenter Glue
- One brass hinge as detailed on drawing, page 14
- 1/2" x #17 brads
- One brass catch as detailed on drawing, page 14
- 4 screws: 1" x #6
- Varathane or equivalent gloss varnish

Tools needed:

- Drill press
- Table saw
- Sander
- Hammer
- Ruler
- Square
- Brush
- Screwdriver

BALL ROLL TRACKING TOY

CUTTING SUGGESTIONS

To make four Ball Roll Tracking Toys, buy 20 linear feet of 1" x 8" clear grade wood (actual thickness is 3/4"); may be sugar pine, mahogany, or maple. Buy in lengths of two feet or multiples of two feet. Be sure every piece is flat, as cupped, warped, or twisted stock will not work well. You also need a piece of 1/2" plywood 33" x 32" and a piece of 1/4" plywood 12" x 18" (birch preferred).

Equipment needed for this job includes: a table saw with normal crosscut and rip blades and dado blades; and a powered belt sander (#100 grit belt). A drill press to straight-drill the twenty 1-1/8" diameter holes would be helpful.

Cut the 1" x 8" stock into 2-foot lengths (approximately), making 10 pieces in all. From two of the 2-foot lengths, cut four pieces 7½" long. Then cut each down the center to make eight pieces 3-3/8" x 7½". Finally make a diagonal cut on each of the eight pieces (see detail on page 8). Glue these triangular pieces in pairs to make eight end braces.

The remaining eight pieces of 1" x 8" x 2' stock are to be cut lengthwise to make four 1-5/8" strips (from each piece). The result will be 32 pieces that measure 3/4" x 1-5/8" x 23-7/8" (approximately). (See detail on page 8.)

Using the dado blade(s), cut a slot 1-1/8" wide x 3/8" deep down the length of each of the 32 strips. The resulting cross-section of these runway strips will be as shown in detail #1, page 9. It is important to make this dado cut accurately so final assembly can be made neatly.

Cut four of the slotted runway pieces to 15¼" length, and four to 15-1/8" length. These will be the upright pieces.

Cut four of the slotted runway pieces to 23-11/16" length. Trim the ends at 5° as shown in detail #2, page 9. These will be the bottom runway pieces.

Cut out corner pieces as shown in detail #3, page 9. Maintain the 5° angles as shown in detail #4, page 9.

The remaining 20 slotted runway pieces are to have a hole 1-1/8" in diameter drilled through at one end of each piece in the center of the runway as shown in detail #5, page 10. Use either an expansive bit or a 1-1/8" power wood boring bit to drill the holes.

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BALL ROLL TRACKING TOY

At the same end where the hole has been bored, carefully trim the ends at a 5° angle on all 20 slotted runway pieces as shown in detail #6, page 10.

Take four of the 20 pieces above and cut the opposite end square at 23-9/16" length as shown in detail #7 on page 10. These are the top runway pieces.

The remaining 16 slotted pieces are to be cut to 23¼" in length as shown in detail #8 on page 10.

Then the end opposite the hole is to be trimmed off at a 5° angle as shown in detail #9, page 11.

Finally, the corner pieces are to be cut out as shown in detail #10 on page 11. The 5° angle is to be maintained on the cutting as shown in detail #11, page 11.

Cut out 20 pieces of 1/4" plywood to the size shown in detail #12; four to size in detail #13, and four to size in detail #14. These are gusset pieces.

ASSEMBLY JIG FOR RUNWAY FRAME - See page 12

To assemble the pieces you cut out so the ball will roll properly, it is strongly recommended that an assembly jig be made. It can be made quickly of scrap wood.

Use a piece of 1/2" or heavier plywood that is 23-3/8" x 18" or larger. This makes the base for the jig.

Along one of the 23-3/8" edges nail a bottom strip of wood that protrudes 1/2" or so above the surface of the plywood. Best results are obtained if the plywood, with bottom strip attached, is fastened to the workbench.

Nail two alignment pieces that are 3/4" x 2" x 18" onto the plywood at 90° to the bottom strip of wood and 24-3/8" apart. These will align and space the two upright pieces.

Make scrap wood spacers as follows: two - 3/4" x 1-5/8" x 3-3/8" for the vertical spacers; one - 3/4" x 1-5/8" x 1-3/4" for the bottom spacers; one - 3/4" x 1-5/8" x 6" cut off on the top as shown in detail F on page 12.

To use the assembly jig, place a 15¼" upright piece on the inside of the left hand 90° to alignment piece; place the 15½" on the inside of the right-hand alignment piece. The slots in both pieces should be facing each other.

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BALL ROLL TRACKING TOY

Place two 3/4" or 1" wide strips of cellophane tape on the plywood jig base and under the upright pieces. This is to keep the glue that joins the runway pieces and the upright pieces from gluing the ball roll frame to the plywood jig base.

CONSTRUCTION SUGGESTIONS

Place the 3/4" x 1½" x 1-3/4" spacer piece alongside the right-hand upright piece with the 1-3/4" dimension parallel with the upright.

Apply Elmer's Carpenter Glue or equivalent to both ends of a bottom piece and place the tongue ends into the upright slots with one runway and resting on the spacer piece. If your cutting has been reasonably accurate, the tongues will fit neatly; if not, a little adjustment will be required.

Leaving the 1-3/4" spacer in place, apply glue to both ends of one of the 20 runway pieces that have a hole in one end and a tongue on the other. Then lay the 5" spacer on top of the bottom runway piece with the wide end butted against the right upright as shown in detail G on page 13. Then place the 3-3/8" spacer alongside and against the left upright as shown. Now put the runway piece on top of the left and the right spacers.

Apply glue to the bottom gusset piece and fasten in place with 1/2" x #17 brads. Then apply glue to a side gusset piece and fasten in place with brads.

As the gussets are nailed in place, the 3-3/8" spacers are leapfrogged on up with the top gusset helping to hold the top runway in place. It is a good idea to strengthen the toy by putting a 1" x #6 screw down from the end of the top runway into the left upright.

After the glue has set for half an hour, remove the runway frame, stand it up and test it.

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BALL ROLL TRACKING TOY

ASSEMBLY OF COMPONENTS

Cut four pieces 8" x 32" from the 1/2" x 33" x 32" piece of plywood. Sand them overall.

Sand and screw a runway frame to one of the 1/2" x 8" x 32" plywood pieces, centering length and width. Glue and screw a triangular brace at either outside end of the runway frame. Make sure the frame is reasonably perpendicular.

Varnish with two coats of Varathane or equivalent.

THE BALL TO BE USED

Considerable review and consideration went into the selection of size and material of the ball. The ball recommended is a chrome-plated steel ball bearing one inch in diameter. Any bearing company will sell these balls, but if there is no local bearing outlet or if a local automotive parts company can't get these bearings for you, write to any of the Berry Bearing Company service centers (see listing on the next page). Request a box of four 1" chrome-plated steel ball bearings at $3.50 per box. U.P.S. charges can be determined ahead for about 10 ounces per four balls and all charges can be prepaid for quick service.

STORAGE BOX FOR THE BALL

A handy storage box can easily be made using the cut-off pieces from the upright slotted runway pieces. Construction detail and hardware sources for the storage box are all shown on page 14 of this plan. Location of the box on the toy is shown in the front view on the first page of this plan.

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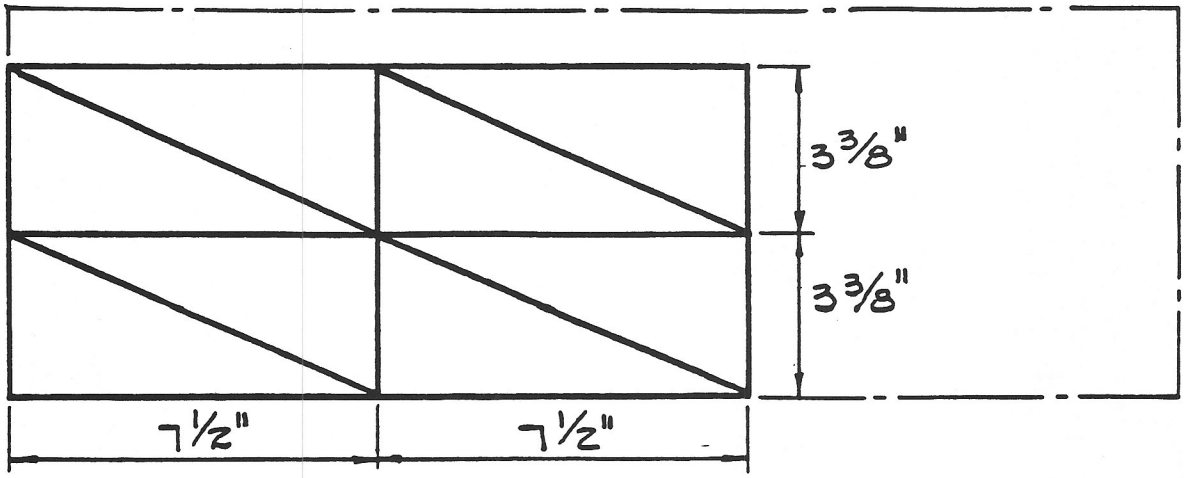
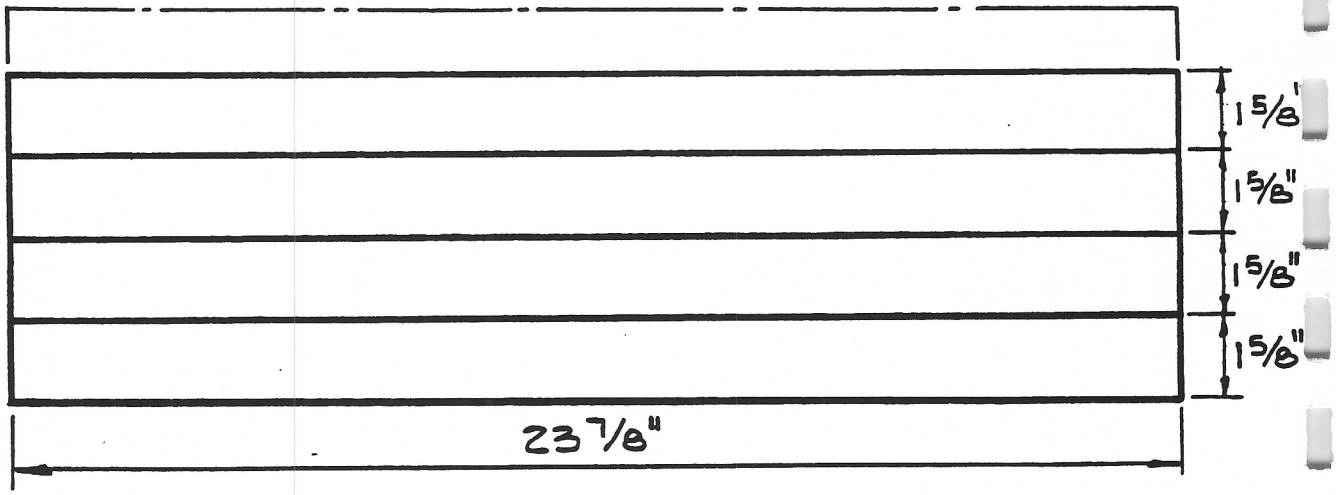


DETAIL A

CUTTING SCHEME OF A 1"X8"X24" BOARD (2 REQ'D) TO MAKE A TOTAL OF 16 TRIANGULAR PIECES (8 PIECES PER BOARD AS SHOWN)

NOTE: BOARD DIMENSIONS ARE NOMINAL
ACTUAL THICKNESS OF BOARD IS 3/4"



DETAIL B

CUTTING SCHEME OF A 1"X8"X24" BOARD (8 REQ'D) TO MAKE A TOTAL OF 32 PIECES 3/4"X 1 5/8 X 23 7/8" (4 PIECES PER BOARD AS SHOWN).

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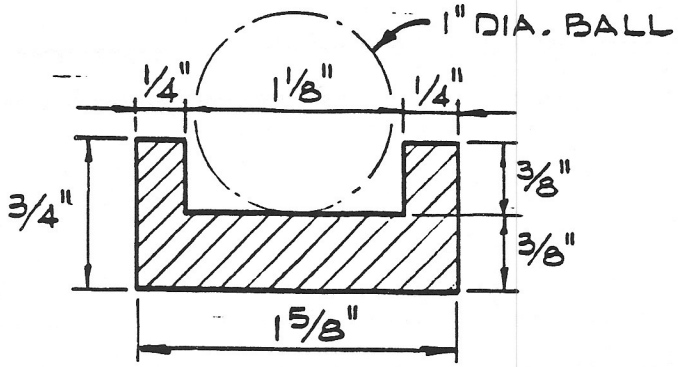
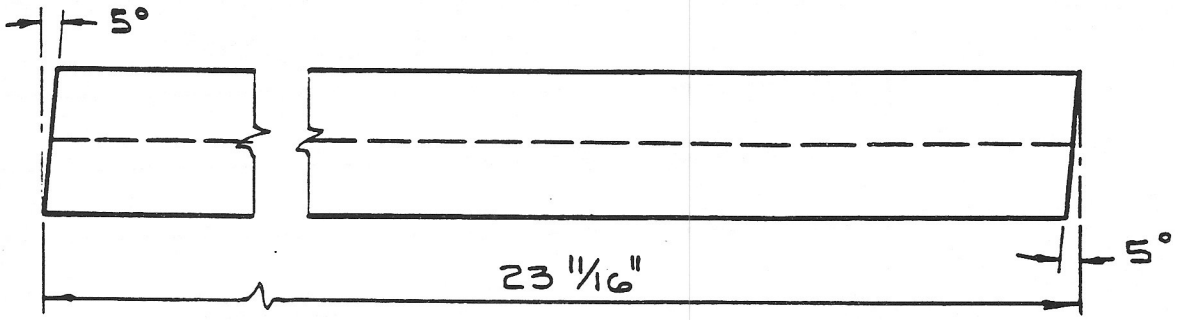
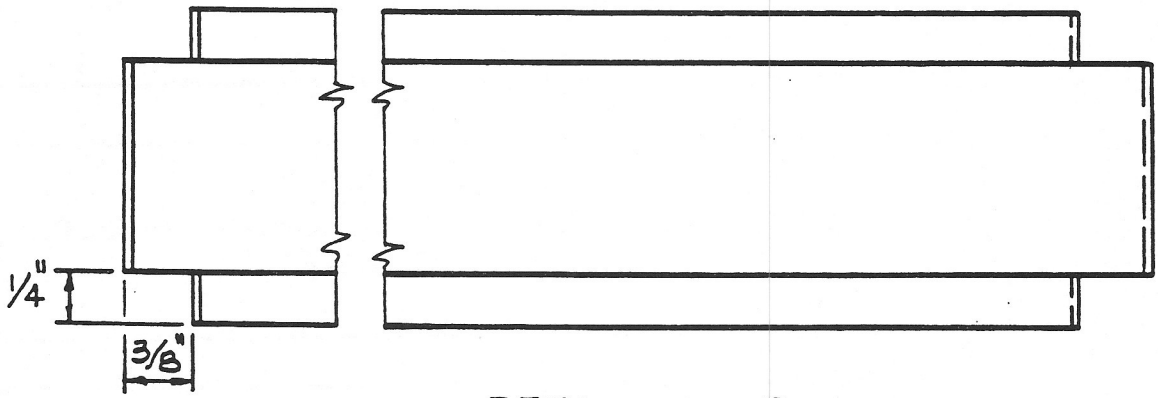


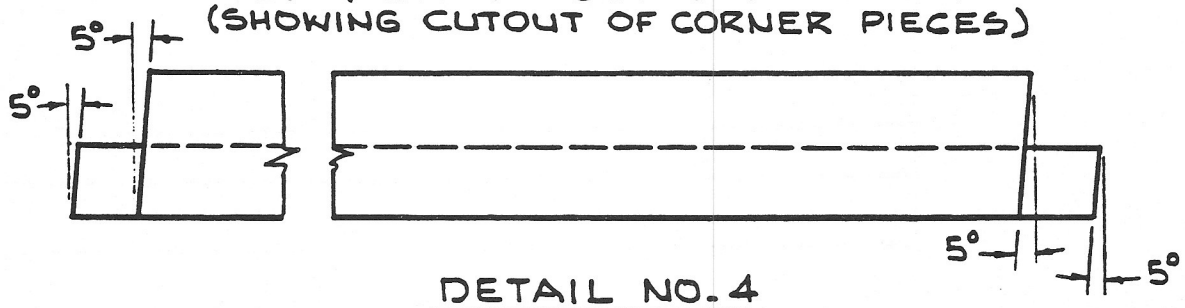
DETAIL NO. 1
CROSS SECTION OF RUNWAY STRIP



DETAIL NO. 2
SIDE VIEW OF BOTTOM RUNWAY
(BEFORE CUTOUT OF CORNER PIECES)



DETAIL NO. 3
TOP VIEW OF BOTTOM RUNWAY
(SHOWING CUTOUT OF CORNER PIECES)



DETAIL NO. 4
SIDE VIEW OF BOTTOM RUNWAY
(AFTER CUTOUT OF CORNER PIECES)

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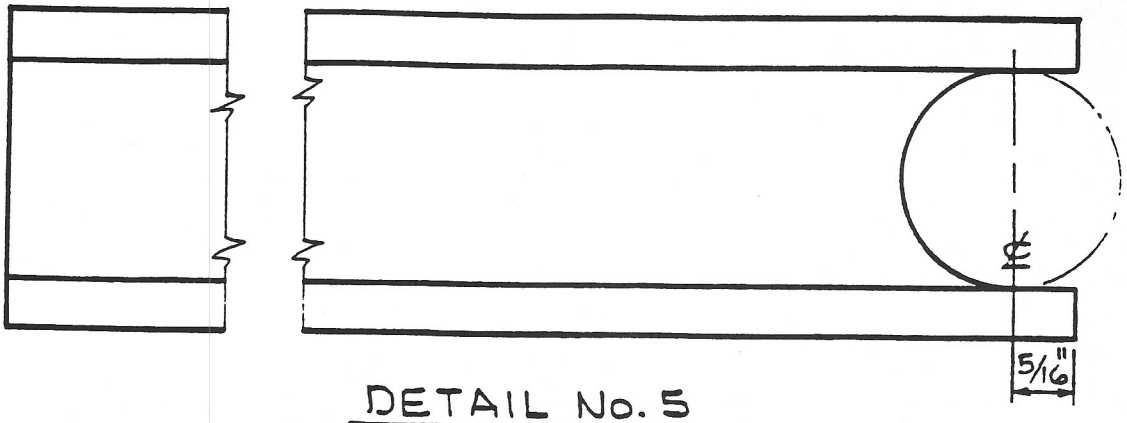
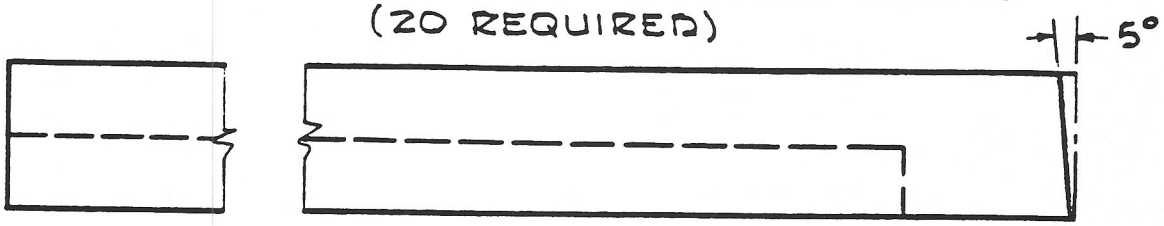


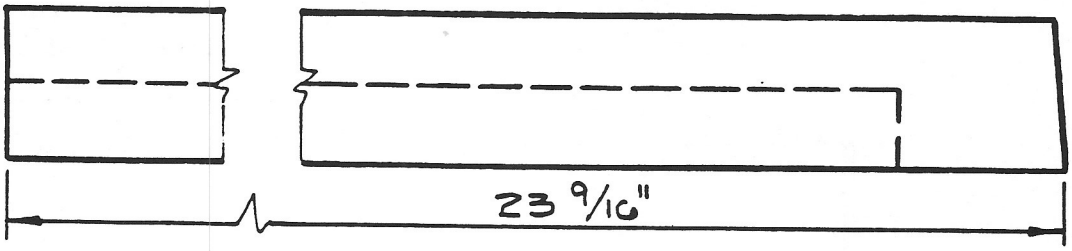
DETAIL No. 5

RUNWAY STRIP SHOWING HOLE CUTOUT DETAIL
(20 REQUIRED)



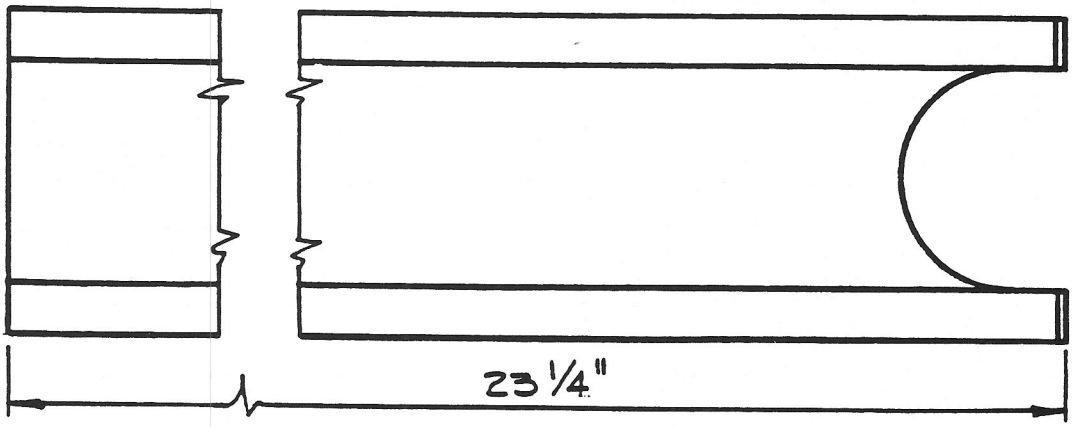
DETAIL No. 6

SIDE VIEW OF RUNWAY SHOWING 5° TRIM @ HOLE END



DETAIL No. 7

SIDE VIEW OF TOP RUNWAY PIECE
(4 REQUIRED)



DETAIL NO. 8

TOP VIEW OF THE REMAINDER OF RUNWAY PIECES
SHOWN BEFORE TRIMMING END OPPOSITE HOLE
(16 REQUIRED)

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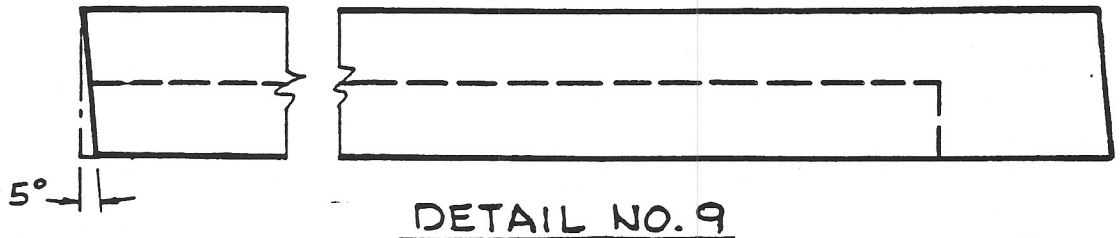
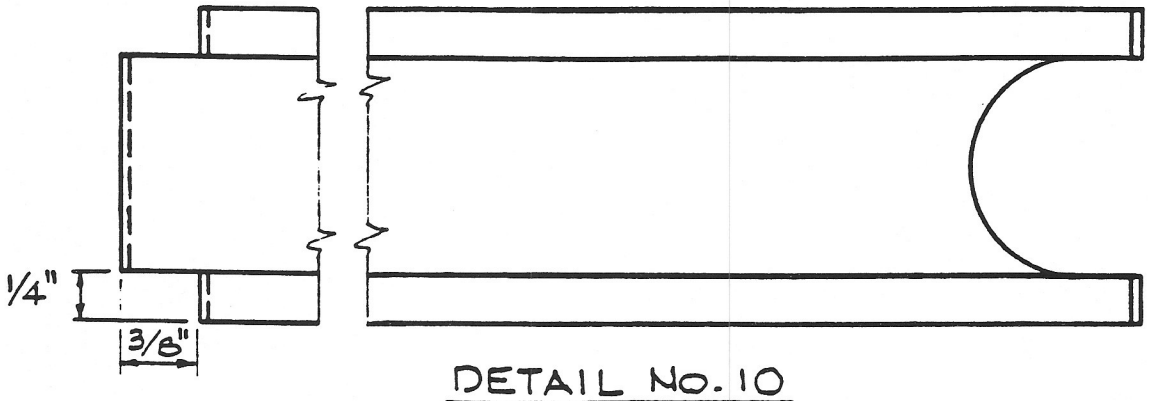


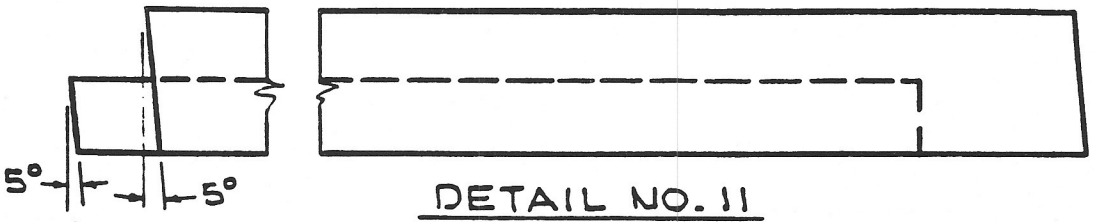
DETAIL NO. 9

SIDE VIEW OF RUNWAY SHOWING 5° TRIM @ OPPOSITE END OF HOLE



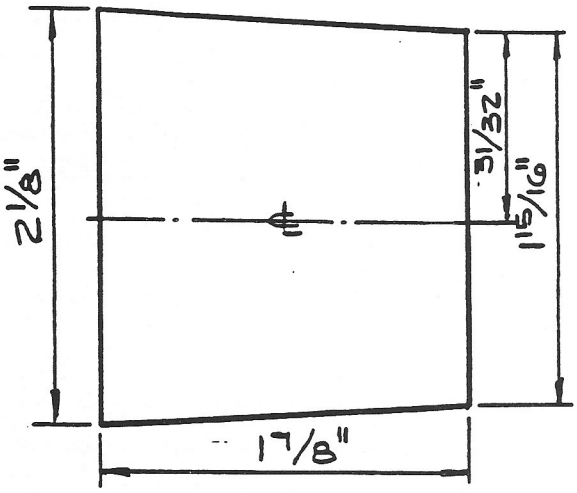
DETAIL NO. 10

TOP VIEW OF RUNWAY SHOWING CUTOUT @ OPPOSITE END OF HOLE



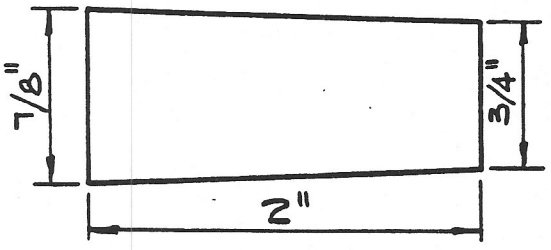
DETAIL NO. 11

SIDE VIEW OF RUNWAY AFTER CUTOUT OF CORNER PIECES



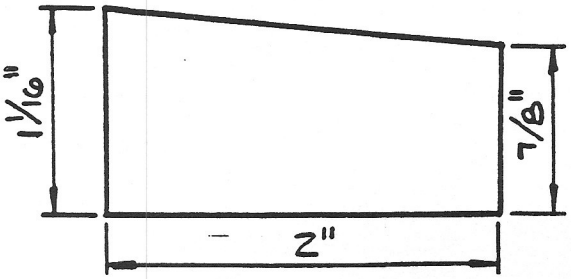
DETAIL NO. 12

SIDE GUSSET
(20 REQUIRED)



DETAIL NO. 13

TOP - SIDE GUSSET
(4 REQUIRED)



DETAIL NO. 14

BOTTOM - SIDE GUSSET
(4 REQUIRED)

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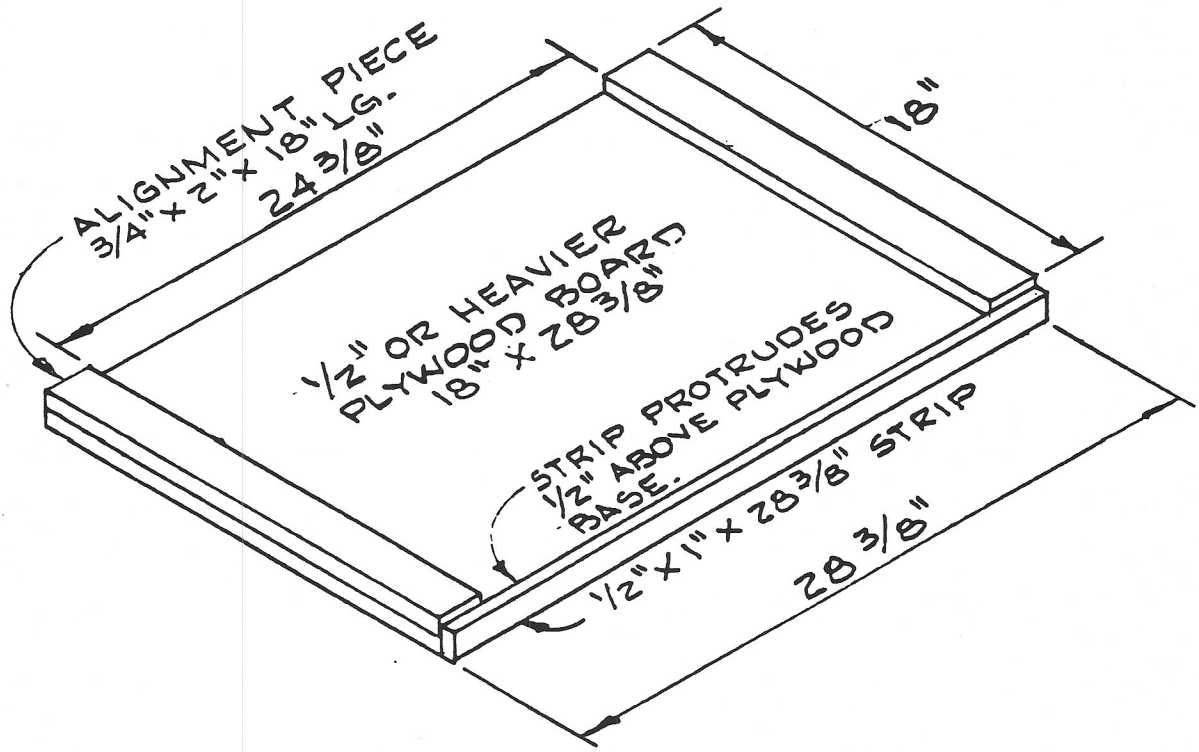
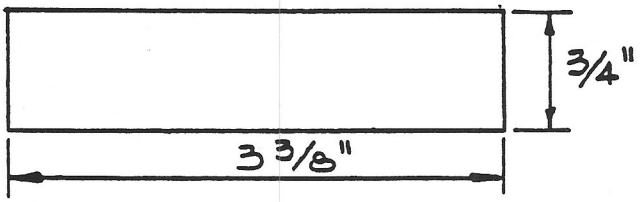
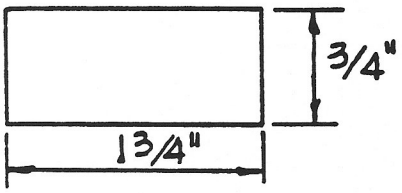


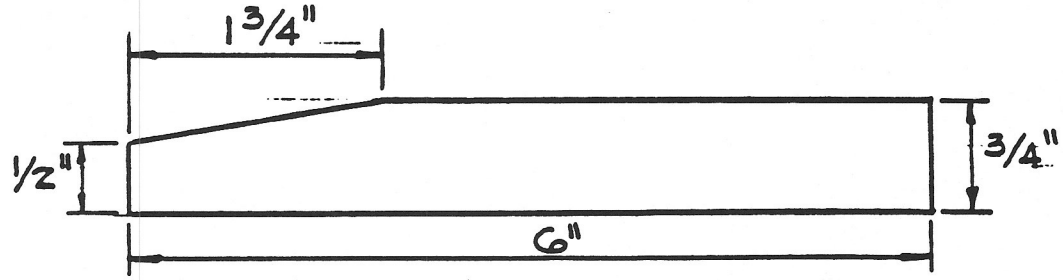
DETAIL C
JIG ASSEMBLY



DETAIL D
VERTICAL SPACER
(2 REQ'D)



DETAIL E
BOTTOM SPACER
(1 REQ'D)



NOTE:
ALL SPACERS
ARE 1 5/8" WIDE

DETAIL F
HORIZONTAL SPACER
(1 REQ'D)

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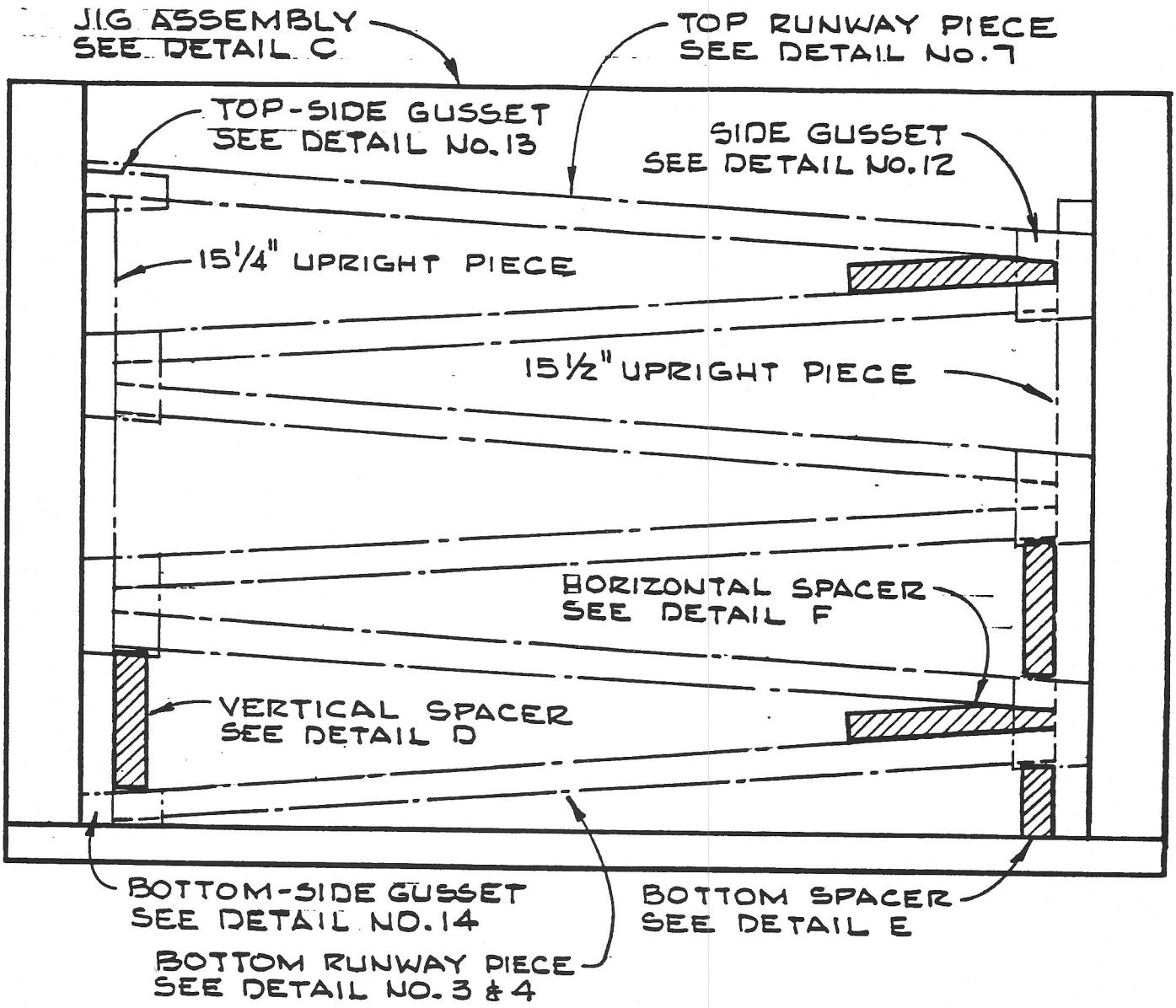

DETAIL G

PLAN SHOWING ASSEMBLY OF RUNWAY FRAME USING JIG AND SPACERS

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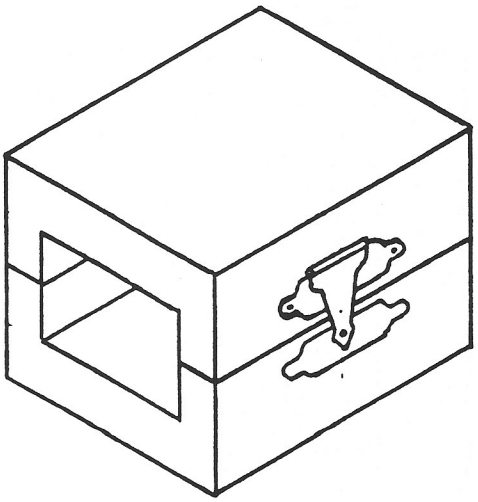
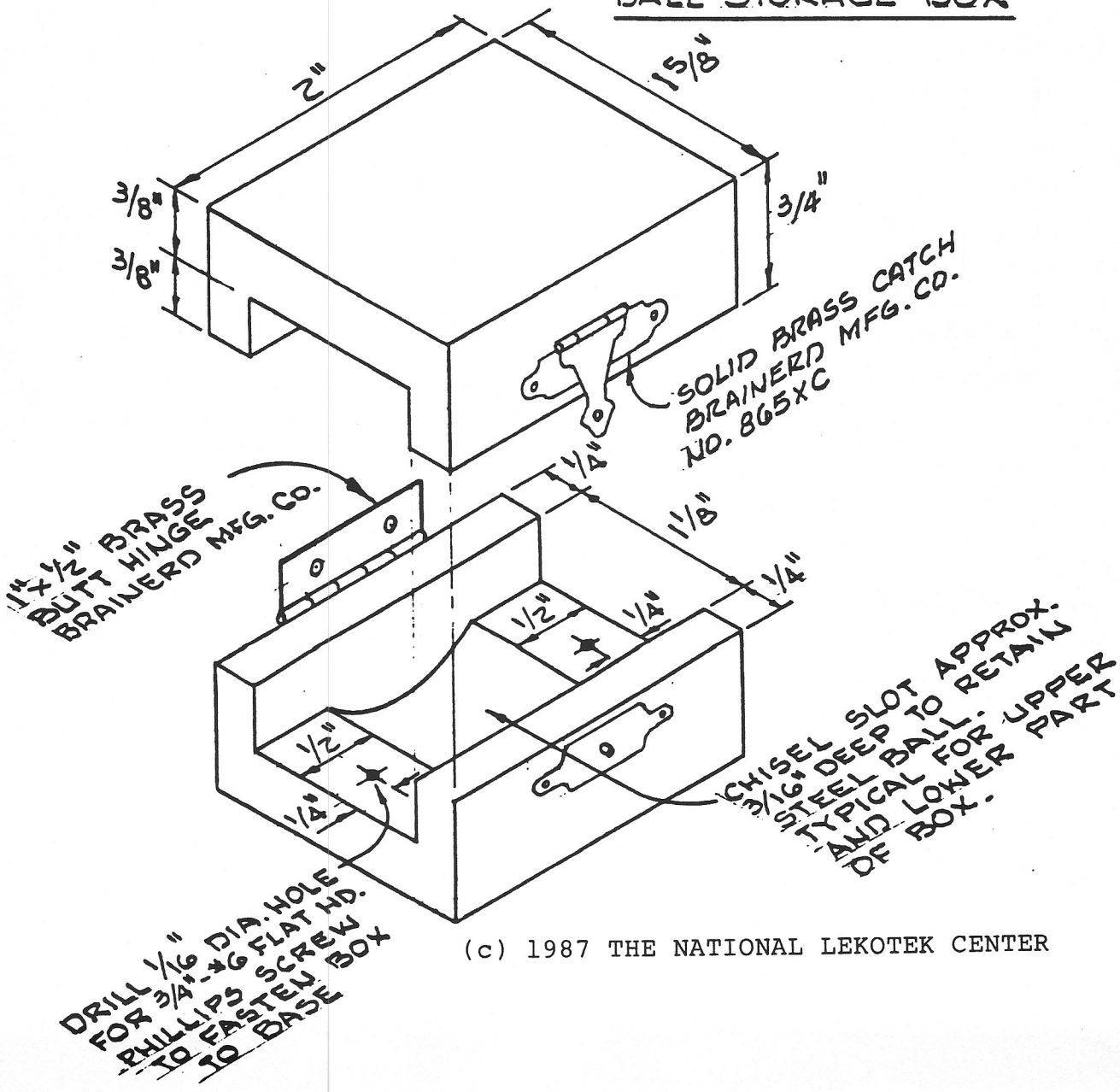


BALL STORAGE BOX



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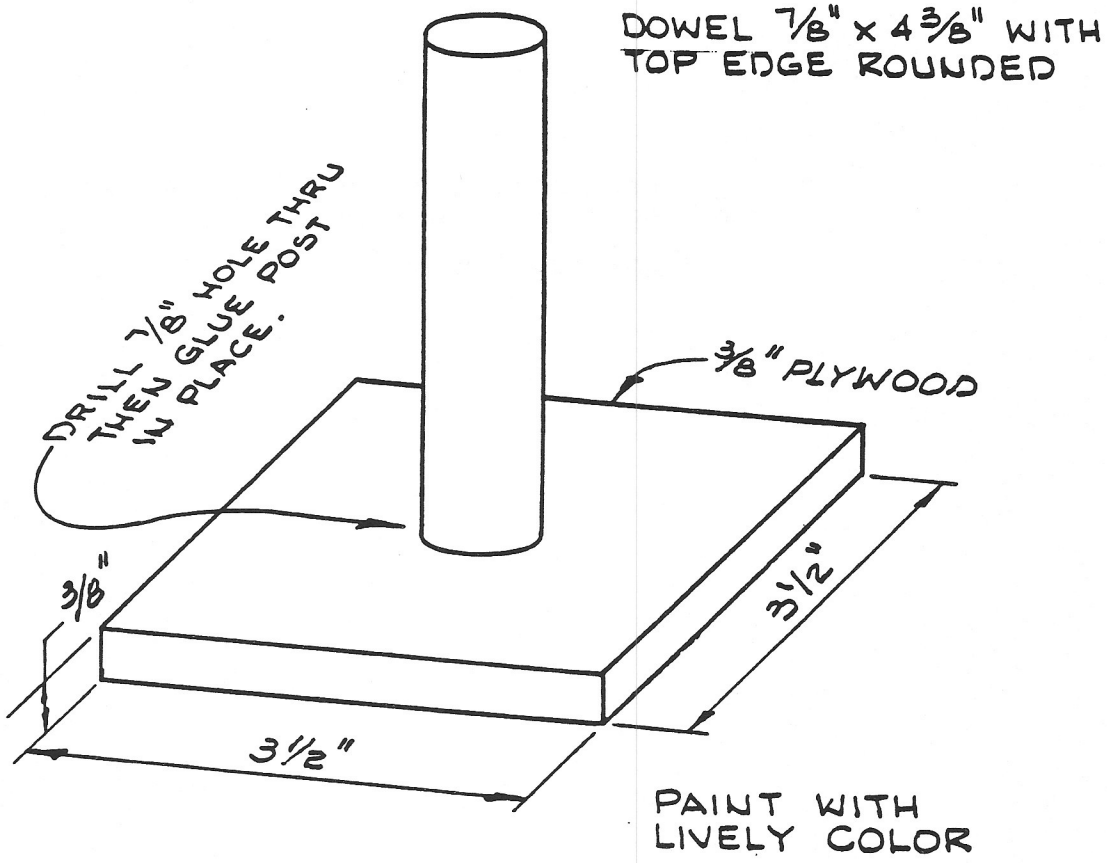
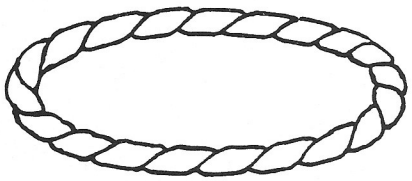
POST WITH FIVE RINGS

Only four inches high, this little stacker uses brightly colored bracelets or macrame rings for its stacking. The child uses a pincer grasp to remove the rings from the peg. Putting the rings back on is easy because the ring is so much larger than the peg.


DOWEL 7/8" x 4 3/8" WITH TOP EDGE ROUNDED
DRILL 7/8" HOLE THRU THEN GLUE POST IN PLACE.
3/8" PLYWOOD
3/8"
3 1/2"
3 1/2"
PAINT WITH LIVELY COLOR



SOLD AS BRACELETS, THE RINGS MAY HAVE A PATTERN AS SHOWN. WHILE SOLD AS MACRAME RINGS THEY ARE SMOOTH.

RINGS ARE 1/4" x 3 1/8" DIA. AND IN MANY COLORS. AVAILABLE FROM A CRAFTS SUPPLY STORE.

TEST THESE RINGS BEFORE PURCHASE BY DROPPING ONE ON THE FLOOR A FEW TIMES.
AVOID THOSE TYPES OF RINGS THAT BREAK, AS THEY LEAVE VERY SHARP POINTS

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POST WITH FIVE RINGS

Materials needed:

- 3½" x 3½" x 3/8" birch plywood
- 7/8" x 4-3/8" dowel
- Elmer's Carpenter Glue
- 5 bracelets or macrame rings in various colors: 1/4" x 3-1/8" in diameter
- Varathane or equivalent enamel in bright colors

Tools needed:

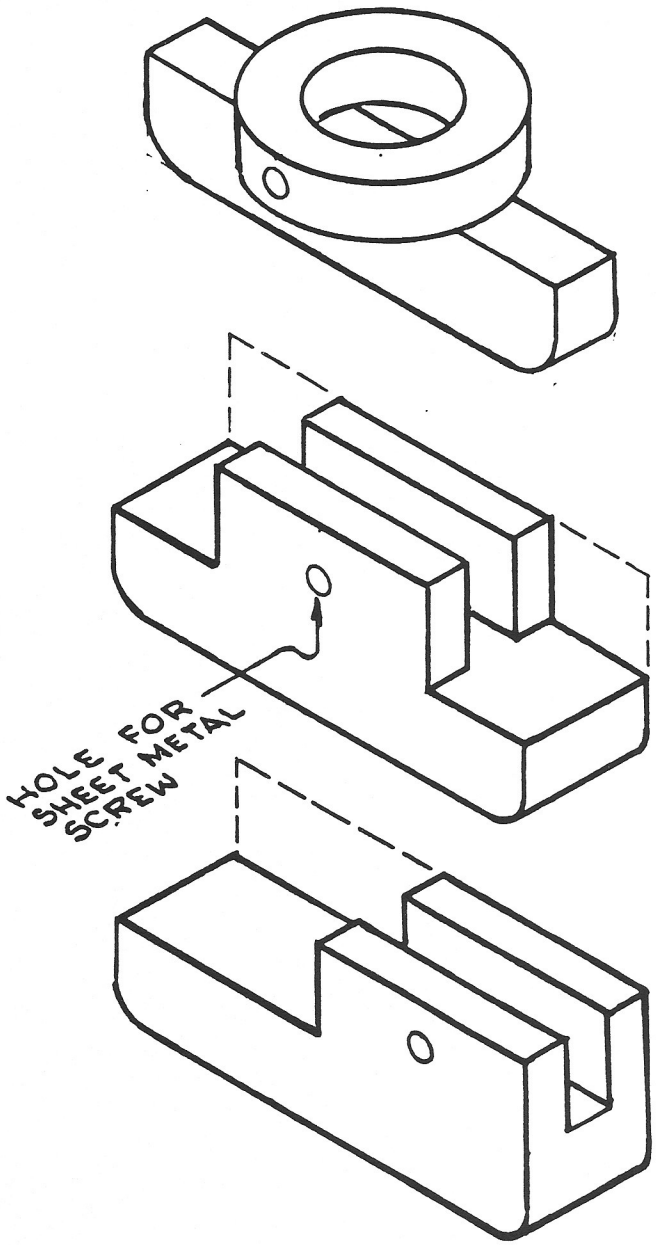
- Saw
- Electric drill and 7/8" drill (a drill press is a very handy tool for this)
- Sandpaper or sander

TOY HANDLE EXTENSIONS

These are additions to purchased toys to make them usable for some Lekotek children.

Purchased toys often have on/off knobs or wind-up knobs that are too small for a full fist grasp, or too difficult to revolve, or the knob is recessed out of handy reach.

These extensions fit snugly over the knobs and are fastened to the knob with a sheet metal screw. They are made of plywood or soft birch, sanded smooth, and painted in bright colors.



The circular plywood piece of this handle extension is to have the center hole cut using an adjustable circle cutter (Stanley Tools) to fit the knob. The outer circle is sawn on a jigsaw and sanded to an outside diameter slightly smaller than the recess in the toy where the knob is. The crossbar is attached to the ring with glue.

These straight extensions are of a soft birch or similar wood. They began as a long piece of stock 1" x 1-1/8" high with an underside cut of a width that will make a snug fit on the knob. Then lengths are cut off that will permit rotating the knob or, in the case of the lower one, will allow a downward push only. After being cut off, the pieces must have the dotted areas removed and the hole for the sheet metal holding screw drilled.

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TOY HANDLE EXTENSIONS

Materials needed:

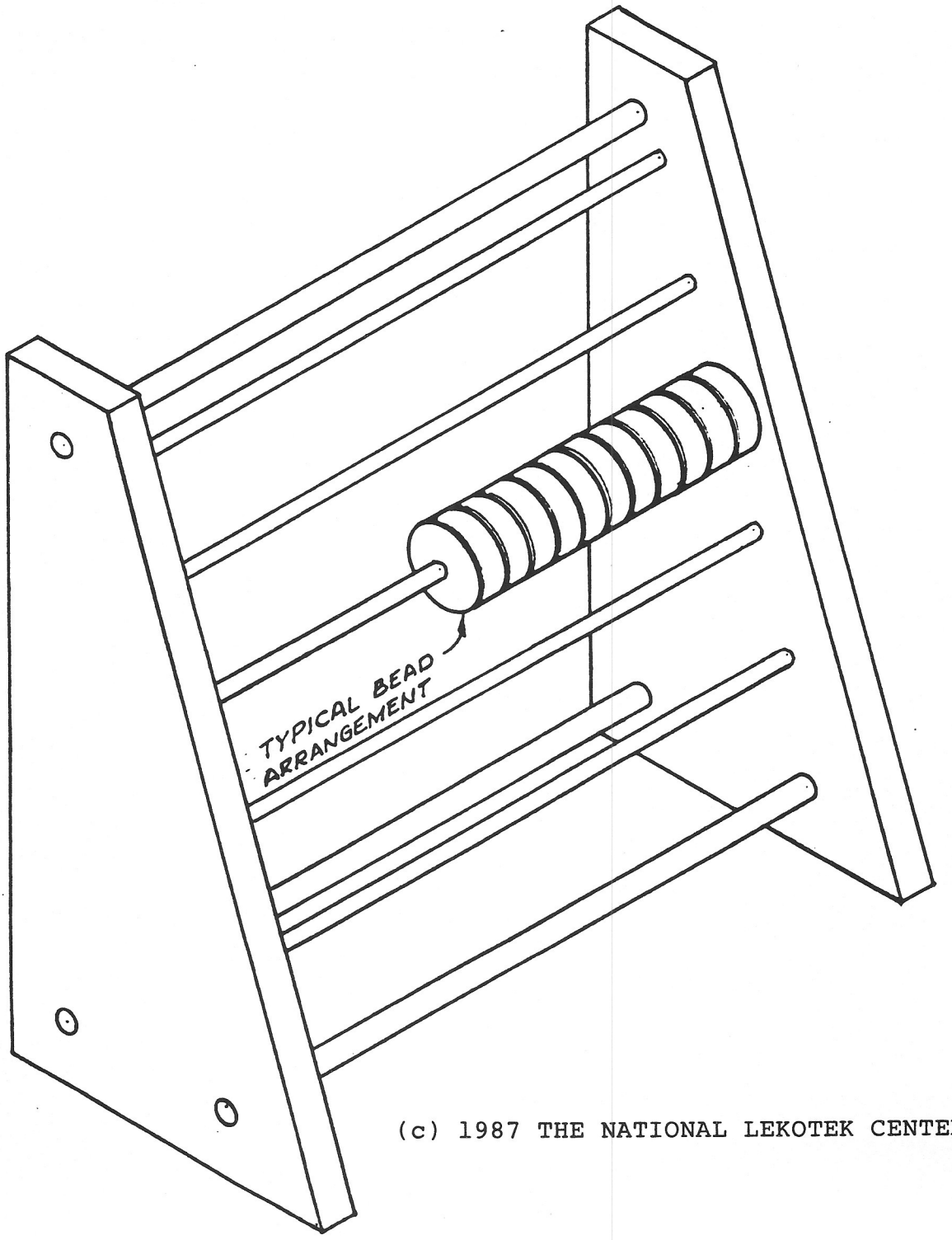
- 2½" x 2½" x 1/2" birch plywood; for circular piece for one size handle
- 1/2" x 3/4" x 3-3/4" wood; for crossbar for the circular piece above
- One-inch stock (actually 3/4") x 1-1/8" high makes the base for the other two shown. The length and slot dimensions depend on the size of the handle the extensions are to fit.
- Varathane or equivalent enamel in bright colors
- #6 sheet metal screws in lengths as indicated

Tools needed:

- Table saw
- Sander
- Adjustable circle cutter
- Screw

BEAD COUNTER

Although this is a wonderful bead counter for older children, this colorful toy can be effectively used with younger children. The larger beads permit slam-bang action with hands and with feet.



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BEAD COUNTER

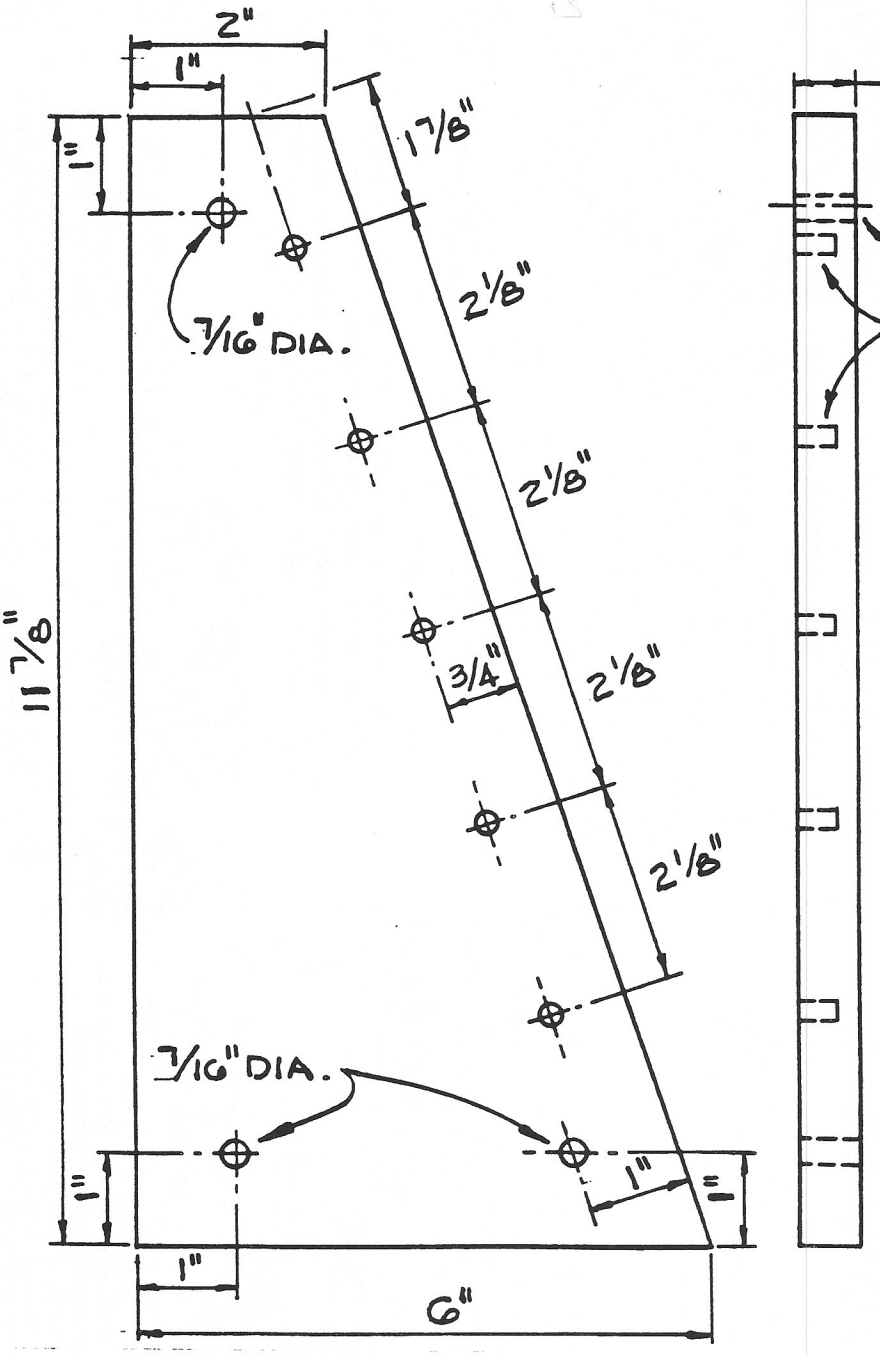
Materials needed to make six counters;

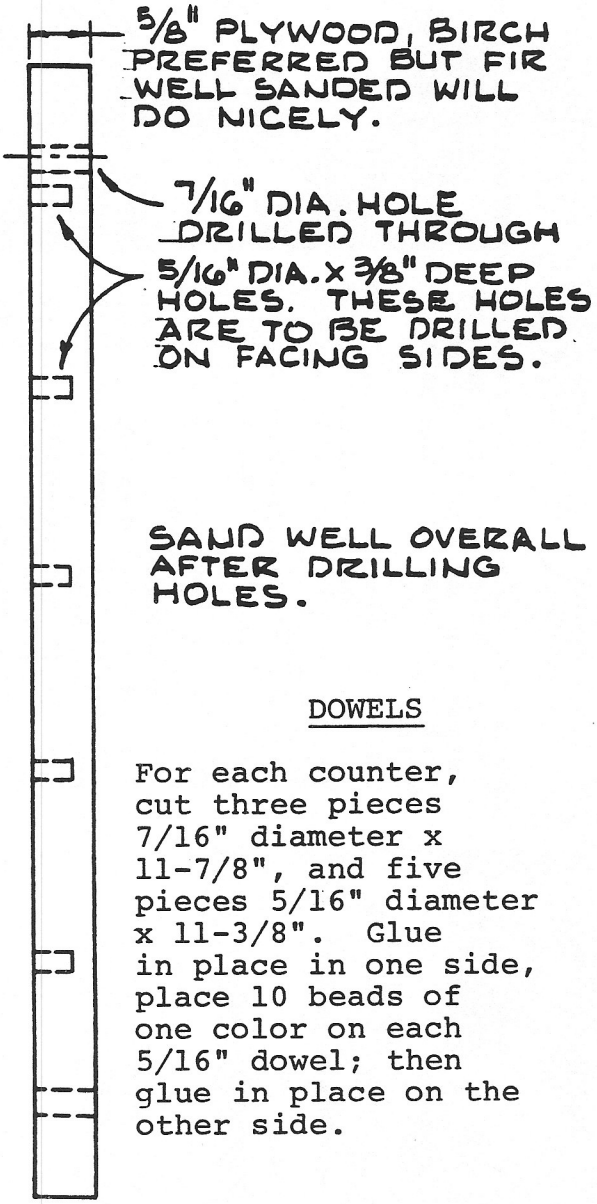
- 300 (two gross plus 1 dozen) wheels: 1½" diameter
- 18 pieces dowel: 7/16" x 11-7/8"
- 30 pieces dowel: 5/16" x 11-3/8"
- 6 pieces birch plywood: 6-1/8" x 11-7/8" x 3/8"; cut to size as shown on drawing
- Varathane or equivalent gloss varnish
- Varathane or equivalent enamel in five bright colors
- Elmer's Carpenter Glue

Tools needed:

- Table saw
- Sander
- Drill press
- Set of drills
- Ruler
- Brush
- Sandpaper

BEAD COUNTER




5/8" PLYWOOD, BIRCH PREFERRED BUT FIR WELL SANDED WILL DO NICELY.
7/16" DIA. HOLE DRILLED THROUGH
5/16" DIA. x 3/8" DEEP HOLES. THESE HOLES ARE TO BE DRILLED ON FACING SIDES.
SAND WELL OVERALL AFTER DRILLING HOLES.

DOWELS

For each counter, cut three pieces 7/16" diameter x 11-7/8", and five pieces 5/16" diameter x 11-3/8". Glue in place in one side, place 10 beads of one color on each 5/16" dowel; then glue in place on the other side.

BEADS

Wooden wheels have been found to be very well suited for making bead counters. To make 6 counters, order 2 gross plus 1 dozen wheels of 1½" diameter from Leichtung, Inc. (see following two pages). Enlarge the 1/4" axle holes to 11/32". Spray-paint in five bright colors by spacing 50 wheels at a time on a piece of double-faced carton board 15 inches square. When dry, spray with clear varnish (Varathane or equivalent). When the varnish is dry, turn the wheels over; paint and varnish the other side.

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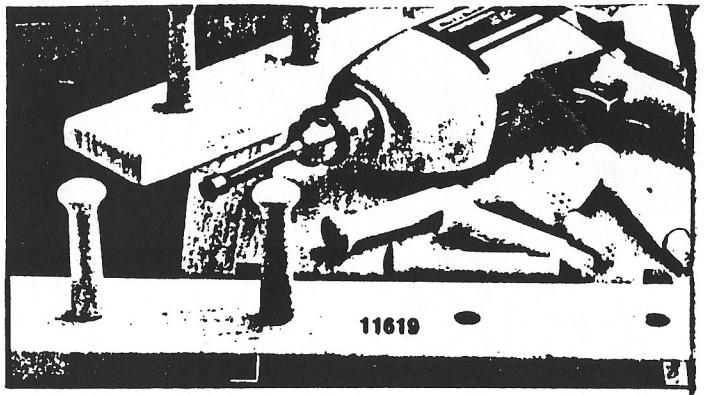
Shaker Pegs- The Heart Of Many Homemade Gifts

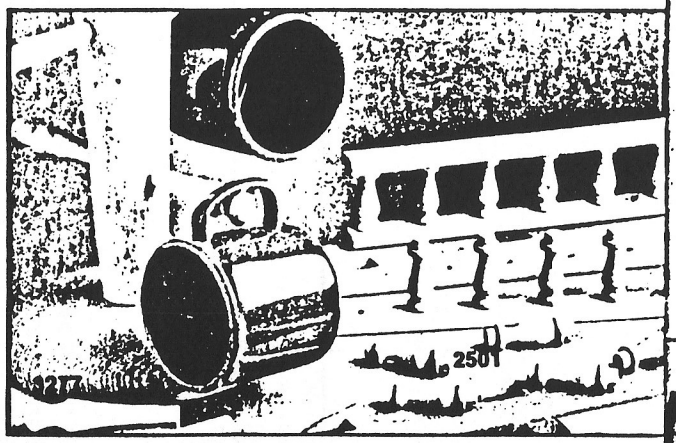


The Shakers, a 19th century sect, were known for the simple lines of their furnishings. These pegs were used to hang clothing, pots and pans and chairs (yes, chairs . . . in a Shaker kitchen chairs were hung on the wall between meals!)

You can make many useful and handsome gifts with just some pegs and some scrap boards. Each peg is 3½" long overall with a ⅝" long tenon tapered for an easy force fit into a ½" hole. Unfinished white birch.

3616 - 12 Shaker Pegs ..... $ 4.95
6171 - 36 Shaker Pegs **(Save $4.90)** ..... $ 9.95
9050 - 144 Shaker Pegs **(Save $29.45)** $29.95
11619 - 24" x 3½" x 1/16" Board For Shaker Pegs (Predrilled) ..... $ 6.95
Buy 2 or more (Save $2 ea.) ..... $ 4.95 ea.

White Birch Turnings To Spiff Up Those Weekend Projects



MUG PEGS — Mugs are so varied and good looking today that they really should be attractively displayed — not stored in a cupboard. (Also keeps them handy for use.) You can make your mug "tree" or rack in a couple of hours.

3277 - Set of 12 mug pegs, 3¼" long 7/16 x ⅜" tenons $4.95
6189 - Set of 36 mug pegs, (as above) **(Save $4.90)** $9.95
9068 - 144 Mug Pegs **(Save $29.45)** $29.95

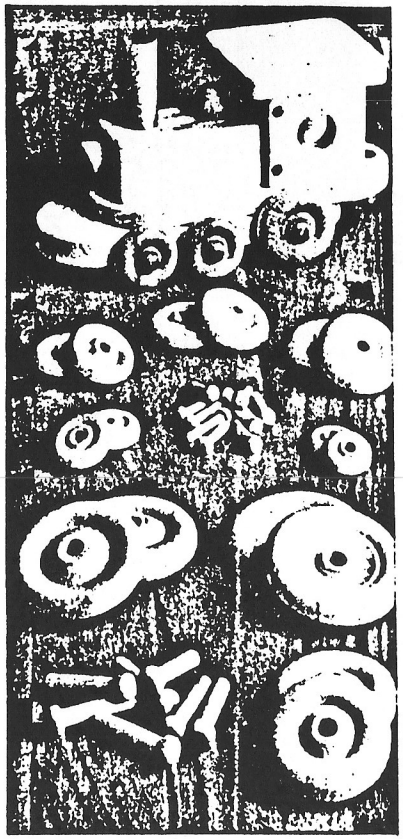
GALLERY SPINDLES — These traditional, gracefully turned spindles are often used on table tops, spice racks, decorative plate rails and even headboards to lend a colonial touch.

2501 - Set of 25, 1½" x ⅝" spindles w/two ¼ x ⅜" tenons ..... $ 4.95
6197 - Set of 100, (as above) **(Save $4.85)** $14.95
9076 - 300 Gallery Spindles **(Save $29.45)** $29.95

Wooden Wheels For Toys

Now you can make those pull-toys that kids love! Precision turned, finely sanded birch wheels and axle pegs make it easy. Wheels 2" and smaller take ¼" axles; wheels 2¼" and larger take ⅜" axle pegs.

9084 - (12) 1" Wheels ..... $ 1.50
9092 - (36) 1" Wheels **(Save $1.55)** ..... $ 2.95
9100 - (144) 1" Wheels **(Save $8.05)** ..... $ 9.95
11254 - (12) 1¼" Wheels ..... $ 1.75
11262 - (36) 1¼" Wheels **(Save $1.75)** ..... $ 3.50
11270 - (144) 1¼" Wheels **(Save $9.05)** $11.95
9142 - (12) 1½" Wheels ..... $ 1.95
9159 - (36) 1½" Wheels **(Save $1.90)** ..... $ 3.95
9175 - (144) 1½" Wheels **(Save $13.05)** $13.95
11288 - (12) 1¾" Wheels ..... $ 2.75
11296 - (36) 1¾" Wheels **(Save $2.30)** ..... $ 5.95
11304 - (144) 1¾" Wheels **(Save $13.05)** $19.95
9183 - (12) 2" Wheels ..... $ 3.50
9191 - (36) 2" Wheels **(Save $2.55)** ..... $ 7.95
9209 - (144) 2" Wheels **(Save $17.05)** $24.95
9225 - (36) ¼" Axle Pegs ..... $ 2.50
9233 - (144) ¼" Axle Pegs **(Save $2.05)** ..... $ 7.95
11312 - (12) 2¼" Wheels ..... $ 4.50
11320 - (36) 2¼" Wheels **(Save $3.55)** ..... $ 9.95
11338 - (144) 2¼" Wheels **(Save $24.05)** $29.95
11346 - (12) 2½" Wheels ..... $ 5.50
11353 - (36) 2½" Wheels **(Save $4.55)** $11.95
11361 - (144) 2½" Wheels **(Save $31.05)** $34.95
11379 - (12) 2¾" Wheels ..... $ 6.95
11387 - (36) 2¾" Wheels **(Save $6.90)** $13.95
11395 - (144) 2¾" Wheels **(Save $43.45)** $39.95
11403 - (36) ⅜" Axle Pegs ..... $ 3.95
11411 - (144) ⅜" Axle Pegs **(Save $1.90)** ..... $ 9.95



BEAD COUNTER

OUR CUSTOMERS SAY:

I have ordered many items from Leichtung and am very well pleased with the prompt service I have received.

I will continue to order from you when I need something and will use other sources only for items you do not carry.

J. D. Spatafore, Rivesville, West Virginia

Wooden Parents And Kids For Toys

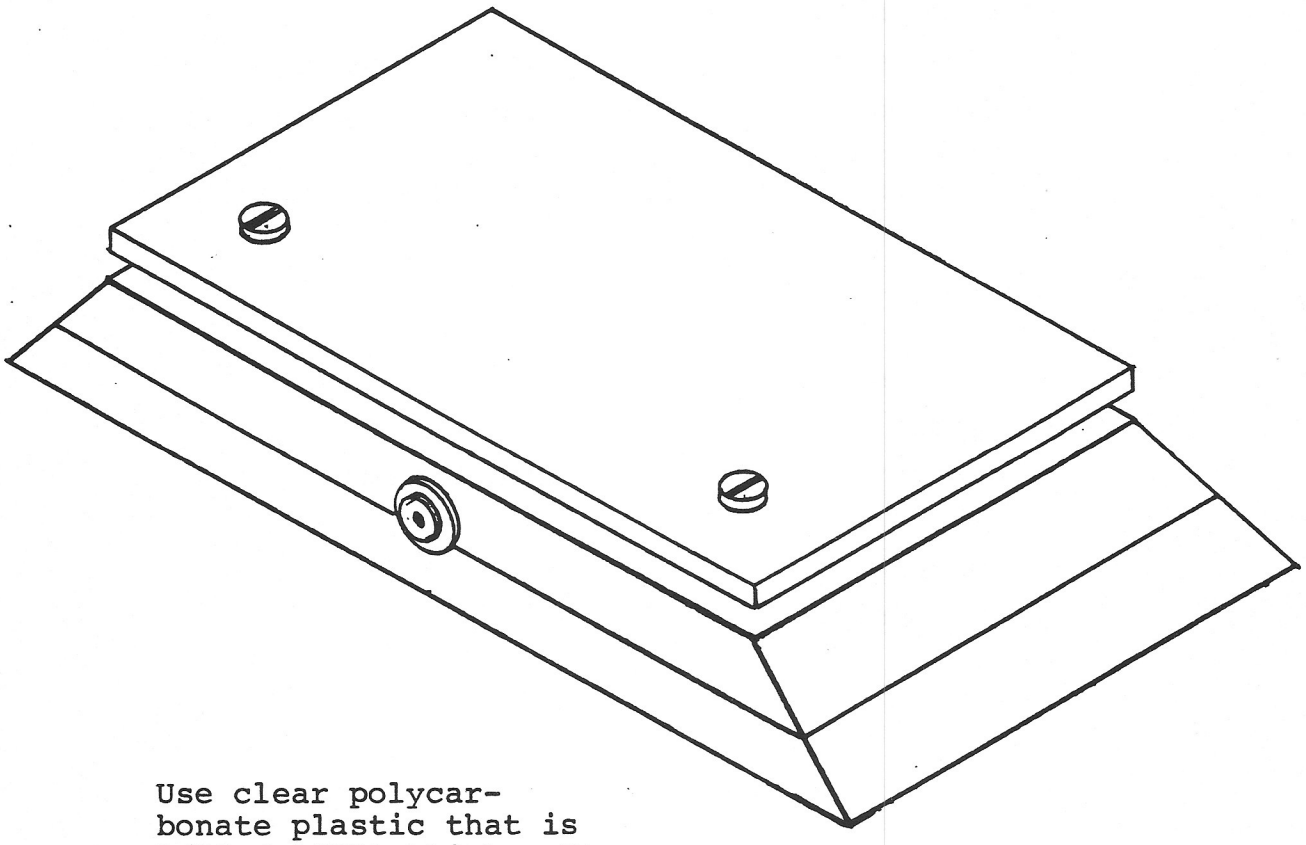
Put parents and kids into your pull toys! Like our wheels, these are precision turned and sanded birch. Parents are ⅞" x 2¼", kids are ⅝" x 1¼".

11023 - 12 Parents $3.95
11031 - 36 Parents **(Save $3.90)** $7.95
11049 - 144 Parents **(Save $22.45)** $24.95
11056 - 20 Kids $3.95
11064 - 60 Kids **(Save $3.90)** $7.95
11072 - 240 Kids **(Save $22.45)** $24.95

LARGE PLATE SWITCH

These plate switches are used to operate adapted toys (see Plan #5). They require minimum pressure and accuracy of touch. They are interchangeably used with a variety of adapted toys. The size of the switch is determined by the child's accuracy of reach.

Construction is very simple. A table saw is a requirement. The 1/2" and the 3/8" plywood should have few or no voids between the plies. The operating panel is clear polycarbonate plastic (Lexan or equivalent) that has been spray-painted a bright color on the underside after the holes have been drilled. The plywood is cut to the width and length dimensions. The slot is cut in the top piece, the bottom screws are put in place, and the front and side 45-degree angle cuts are made. Sanding overall should be followed with two coats of Varathane varnish or equivalent. Disassemble and do the wiring. Reassemble and install the operating panel on top and the non-skid material or rubber pads on the bottom.



Use clear polycarbonate plastic that is 1/8" (.125") thick. It is obtainable from companies that sell glass or any plastic supply house. One is U.S. Plastic Co. in Lima, Ohio. You may order by phone: 1-800-537-9724. Ask for stock no. 43020 in whatever quantity you need at $3.33 (1983) per square foot plus UPS charges.

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LARGE PLATE SWITCH

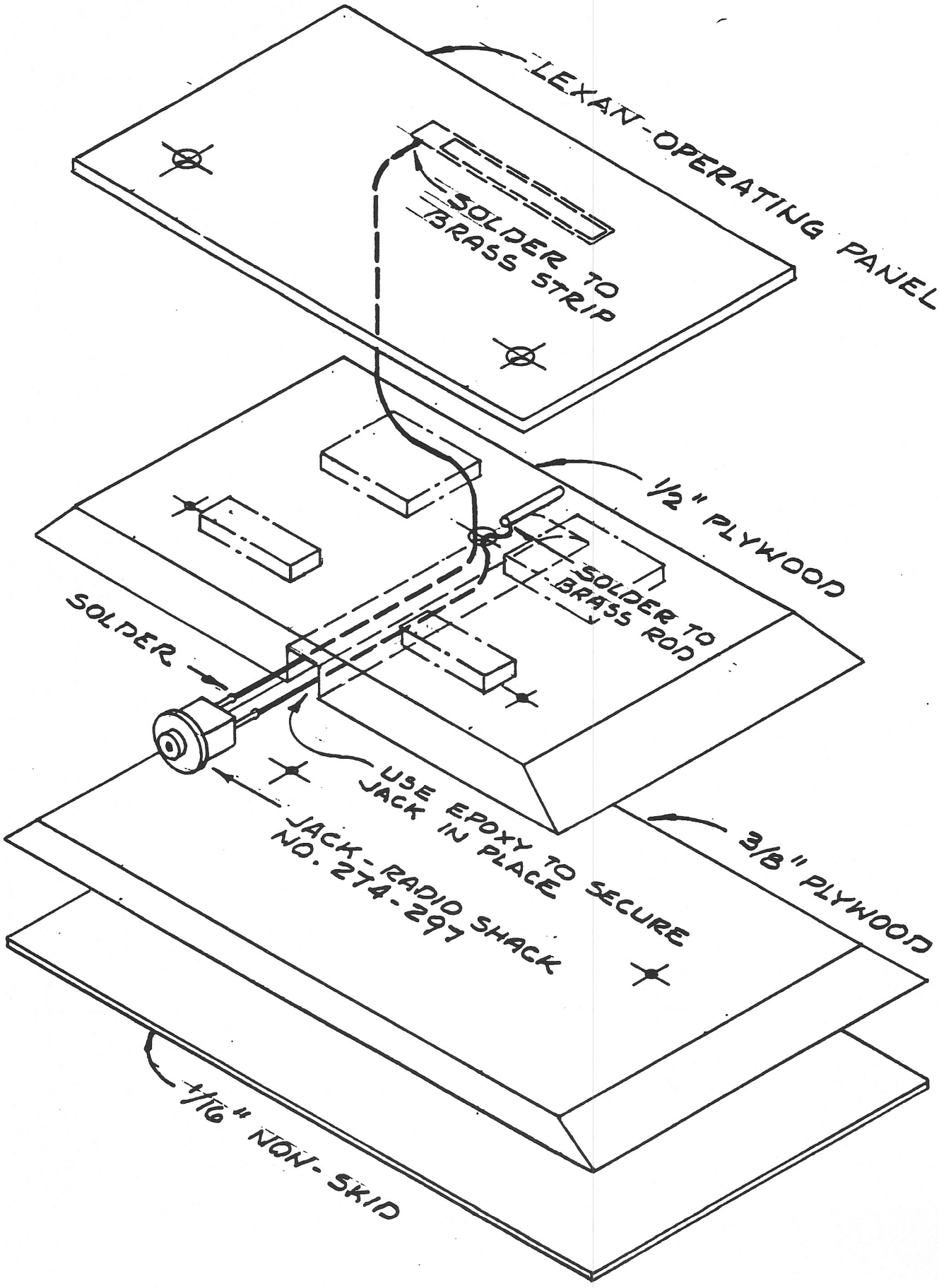
Materials needed:

- Birch plywood: 9¼" x 5-5/8" x 1/2"
- Birch plywood: 9¼" x 5-5/8" x 3/8"
- Clear Lexan: 8" x 5" x 1/8"
- 2 flat-head Phillips screws: 3/4" x #6
- Brass rod: 1/16" diameter x 1"
- Shim stock: 1-7/8" long x 1/4" wide
- Vinyl foam: 1-5/8" long x 1/4" wide x 1/16" thick
- Vinyl foam: 2" x 2" x 1/4" thick, cut into pieces as shown on drawings
- Jack: Radio Shack #274-297
- Rosin core solder
- #20 gauge wire: Radio Shack #278-1307
- Epoxy glue
- Elmer's Carpenter Glue
- Varathane or equivalent gloss varnish
- Varathane or equivalent enamel in bright colors
- Non-skid material or felt: 9¼" x 5-5/8" x 1/16"; this provides a protective bottom surface

Tools needed:

- Table saw
- Sander
- Electric drill and set of drill bits
- Ruler
- Square
- Screwdriver
- Brush

LARGE PLATE SWITCH



WIRING SCHEME

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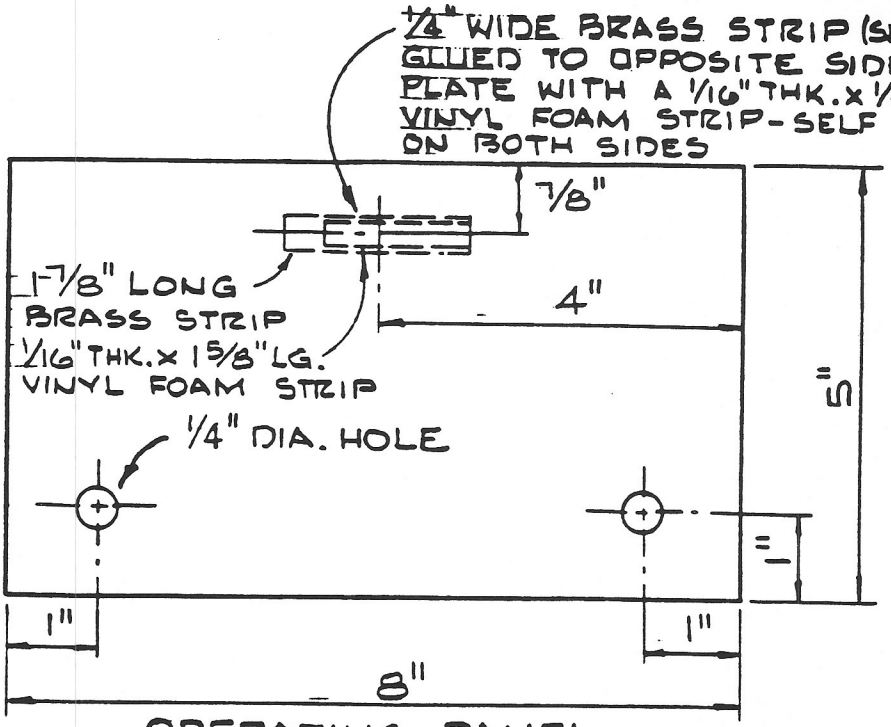
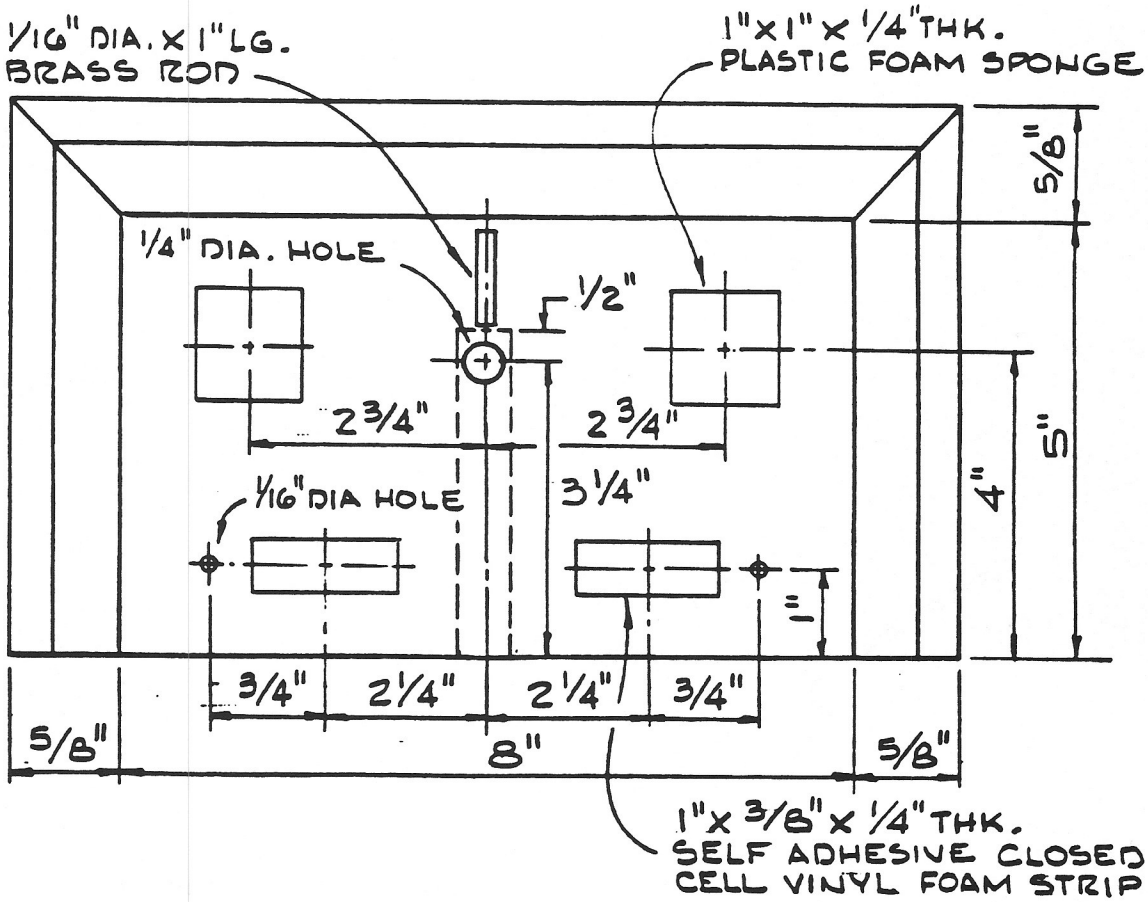

1/4" WIDE BRASS STRIP (SHIM STOCK GLUED TO OPPOSITE SIDE OF PLATE WITH A 1/16" THK. X 1/4" WIDE VINYL FOAM STRIP - SELF ADHESIVE ON BOTH SIDES
7/8"
1-7/8" LONG BRASS STRIP 1/16" THK. X 1 5/8" LG. VINYL FOAM STRIP
4"
5"
1/4" DIA. HOLE
1"
1"
8"

OPERATING PANEL

1/8" THICK CLEAR LEXAN - SPRAY PAINTED



TOP VIEW OF SWITCH BOX

SHOWN WITHOUT LEXAN PANEL

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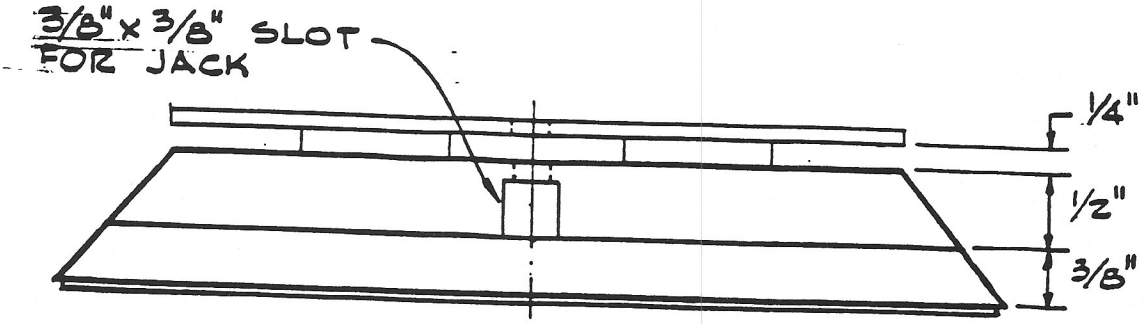
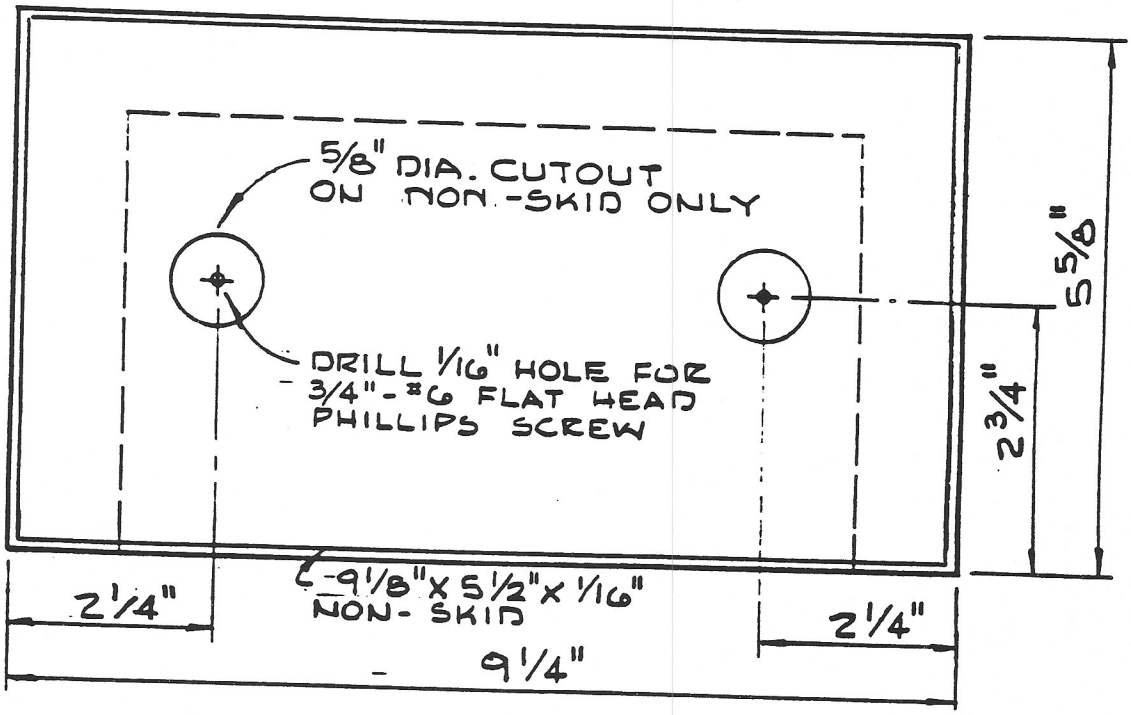
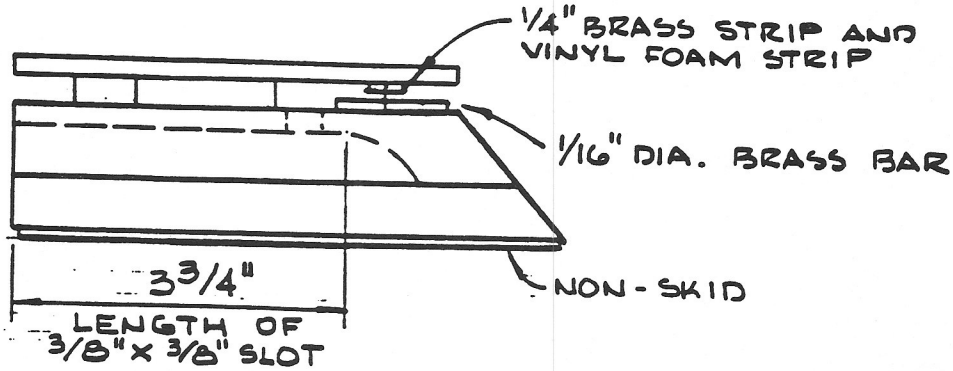


END VIEW OF SWITCH BOX



BOTTOM VIEW OF SWITCH BOX



SIDE VIEW
OF SWITCH BOX

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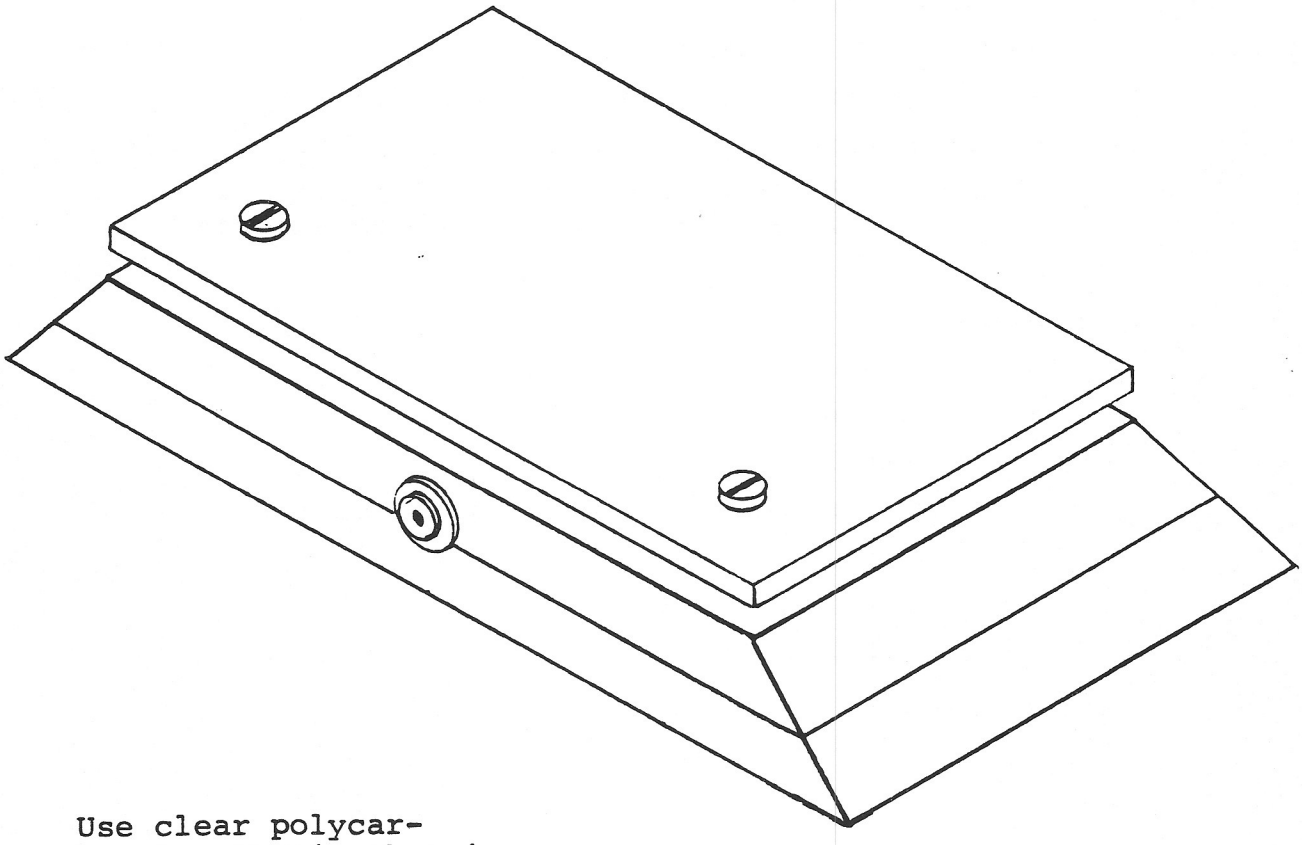
MEDIUM PLATE SWITCH

These plate switches are used to operate adapted toys (see Plan #5). They require minimum pressure and accuracy of touch. They are interchangeably used with a variety of adapted toys. The size of the switch is determined by the child's accuracy of reach.

Construction is very simple. A table saw is a requirement. The 1/2" and the 3/8" plywood should have few or no voids between the plies. The operating panel is clear polycarbonate plastic (Lexan or equivalent) that has been spray-painted a bright color on the underside after the holes have been drilled. The plywood is cut to the width and length dimensions. The slot is cut in the top piece, the bottom screws are put in place, and the front and side 45-degree angle cuts are made. Sanding overall should be followed with two coats of Varathane varnish or equivalent. Disassemble and do the wiring. Reassemble and install the operating panel on top and the non-skid material or rubber pads on the bottom.



Use clear polycarbonate plastic that is 1/8" (.125") thick. It is obtainable from companies that sell glass or any plastic supply house. One is U.S. Plastic Co. in Lima, Ohio. You may order by phone: 1-800-537-9724. Ask for stock no. 43020 in whatever quantity you need at $3.33 (1983) per square foot plus UPS charges.

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MEDIUM PLATE SWITCH

Materials needed:

- Birch plywood: 8" x 4-3/4" x 1/2"
- Birch plywood: 8" x 4-3/4" x 3/8"
- Clear Lexan: 6½" x 4" x 1/8"
- 2 flat-head Phillips screws: 3/4" x #6
- Brass rod: 1/16" diameter x 1"
- Shim stock: 1-3/4" long x 1/4" wide
- Vinyl foam: 1-1/2" long x 1/4" wide x 1/16" thick
- Vinyl foam: 2" x 2" x 1/4" thick, cut into pieces as shown on drawings
- Jack: Radio Shack #274-297
- Rosin core solder
- #20 gauge wire: Radio Shack #278-1307
- Epoxy glue
- Elmer's Carpenter Glue
- Varathane or equivalent gloss varnish
- Varathane or equivalent enamel in bright colors
- Non-skid material or felt: 8" x 4-3/4"; this provides a protective bottom surface

Tools needed:

- Table saw
- Sander
- Electric drill and set of drill bits
- Ruler
- Square
- Screwdriver
- Brush

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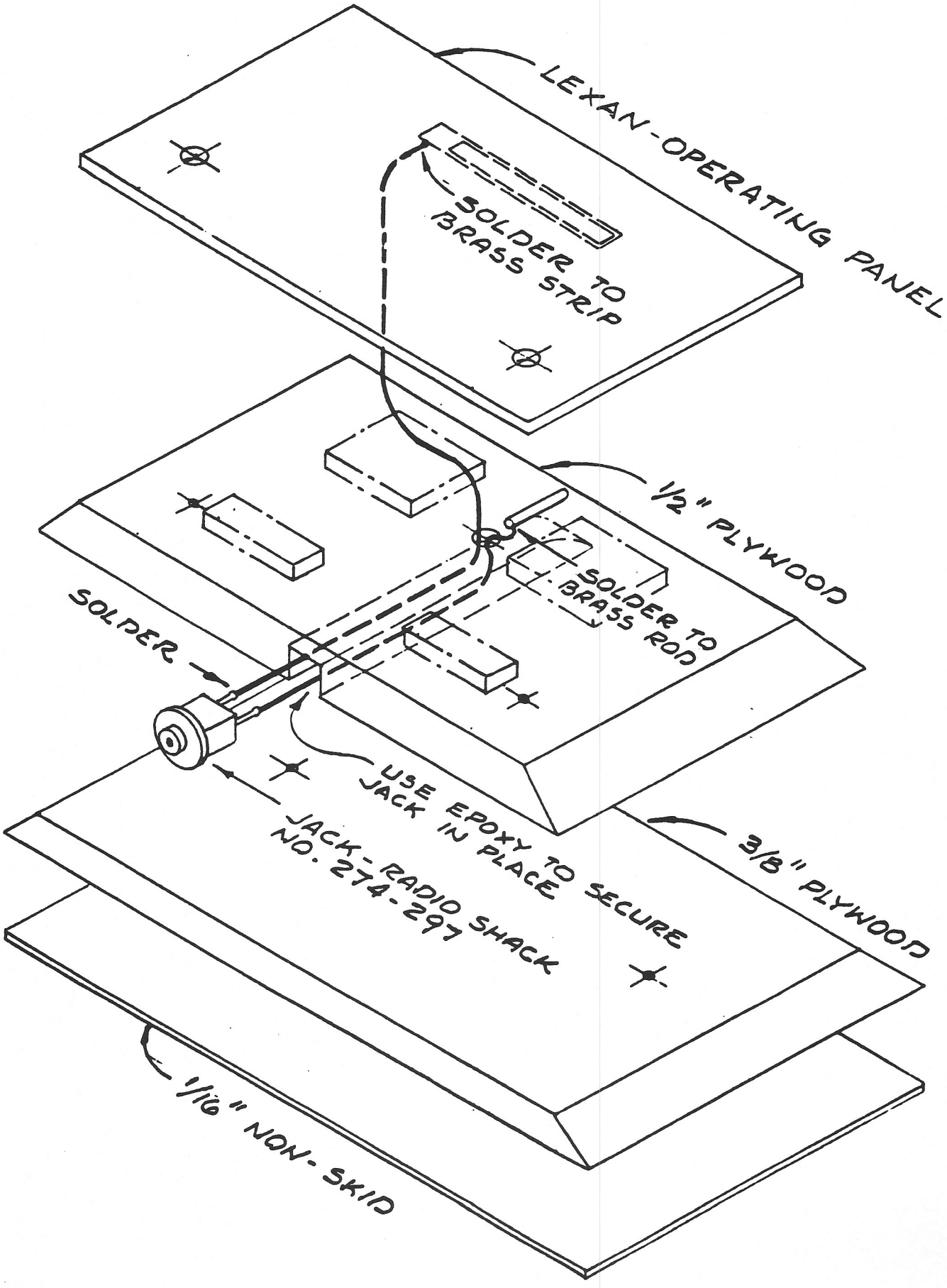
MEDIUM PLATE SWITCH.



WIRING SCHEME

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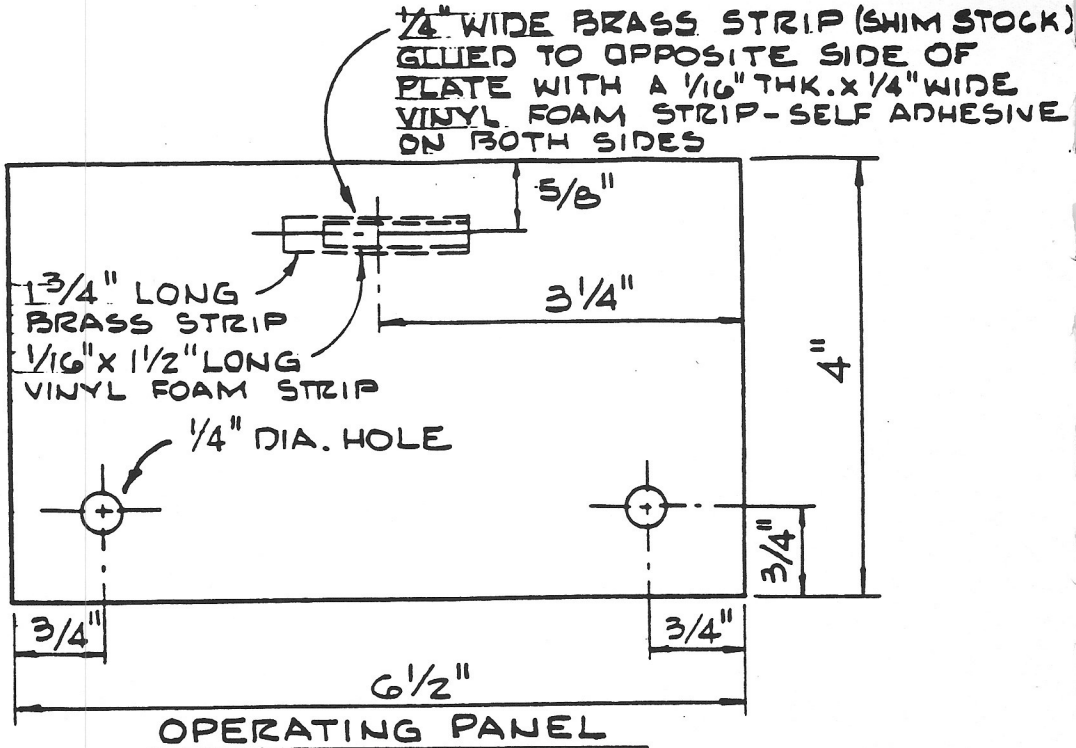
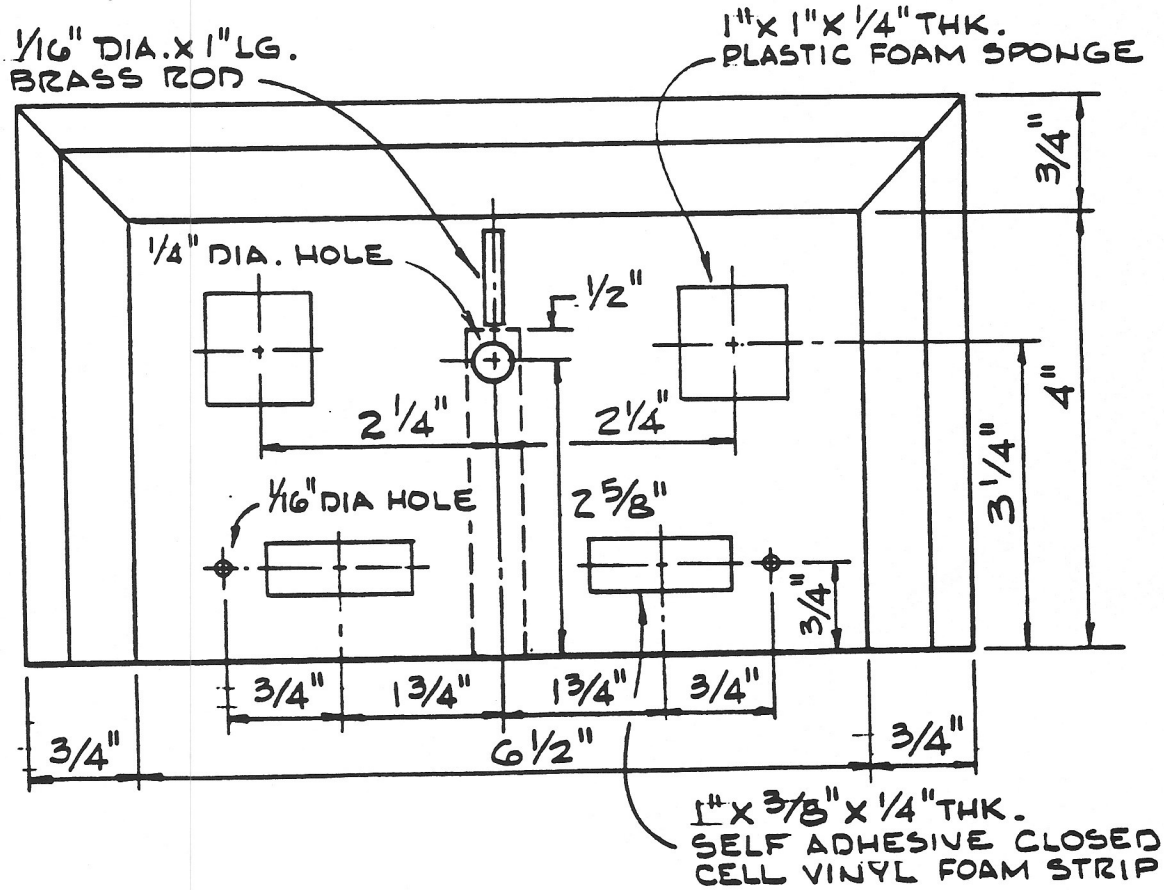
MEDIUM PLATE SWITCH


1/4" WIDE BRASS STRIP (SHIM STOCK) GLUED TO OPPOSITE SIDE OF PLATE WITH A 1/16" THK. x 1/4" WIDE VINYL FOAM STRIP - SELF ADHESIVE ON BOTH SIDES
5/8"
1 3/4" LONG BRASS STRIP
1/16" x 1 1/2" LONG VINYL FOAM STRIP
3 1/4"
4"
1/4" DIA. HOLE
3/4"
3/4"
3/4"
6 1/2"

OPERATING PANEL

1/8" THICK CLEAR LEXAN - SPRAY PAINTED



TOP VIEW OF SWITCH BOX
SHOWN WITHOUT LEXAN PANEL

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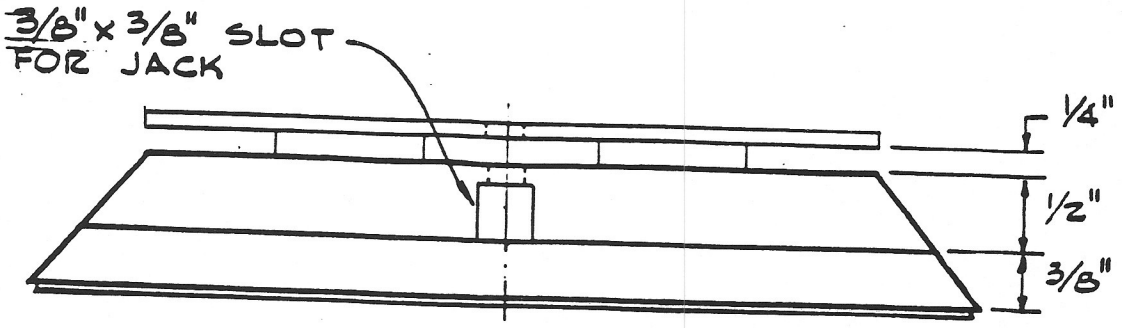
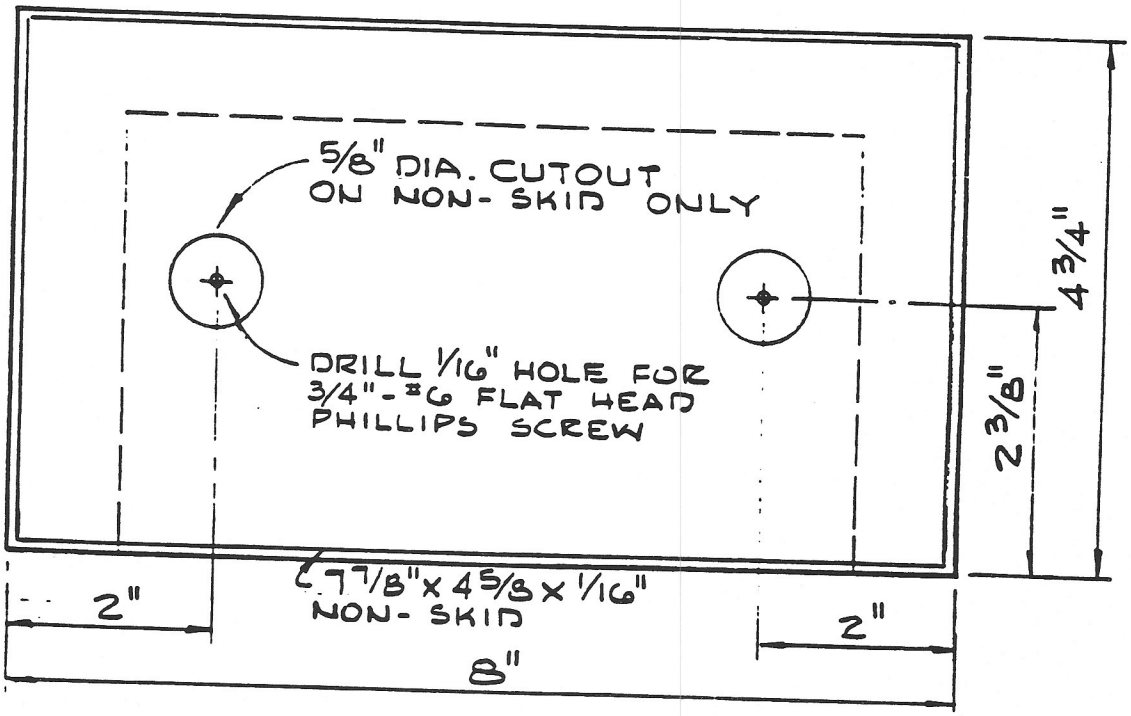
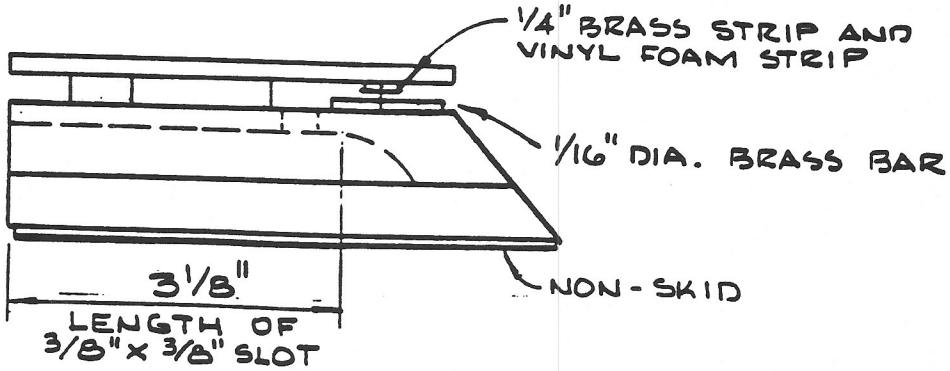
MEDIUM PLATE SWITCH



END VIEW OF SWITCH BOX



BOTTOM VIEW OF SWITCH BOX



SIDE VIEW
OF SWITCH BOX

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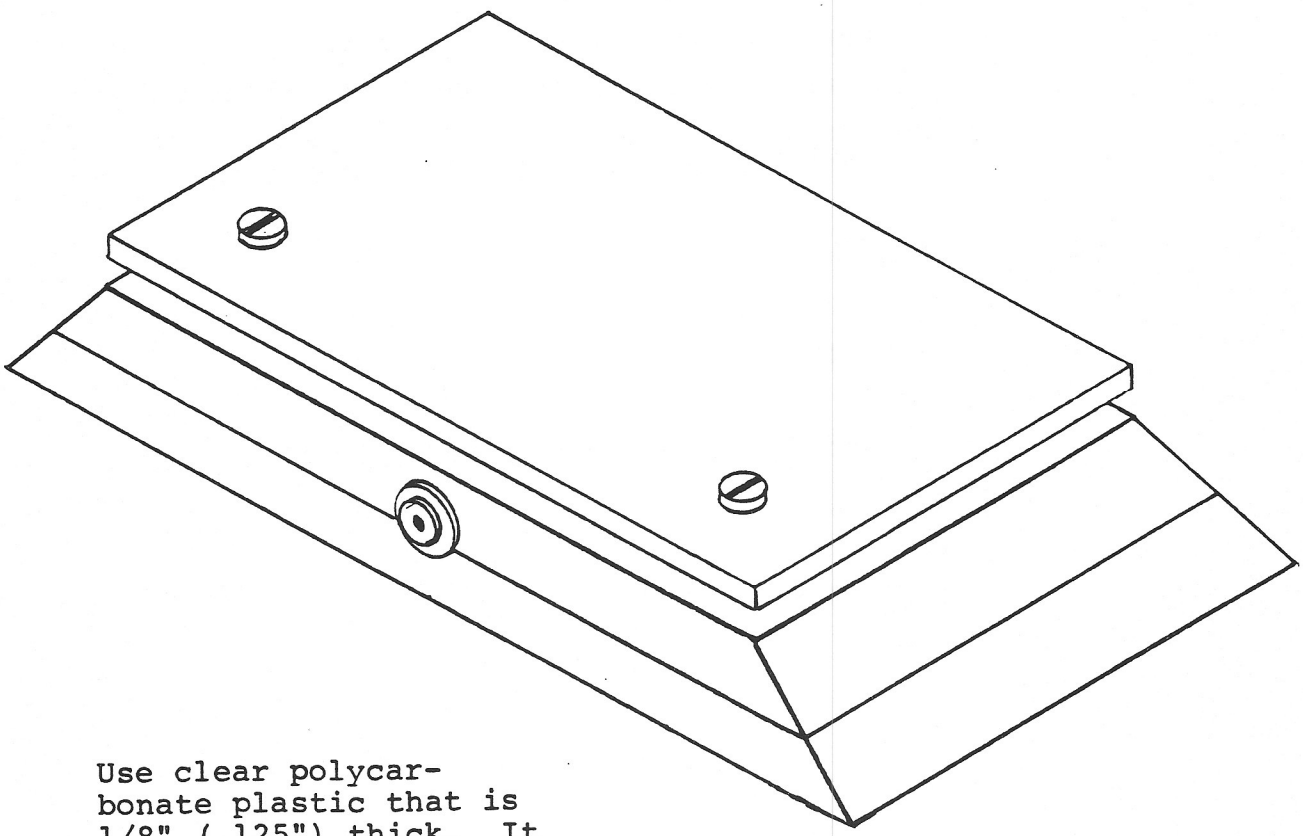
SMALL PLATE SWITCH

These plate switches are used to operate adapted toys (see Plan #5). They require minimum pressure and accuracy of touch. They are interchangeably used with a variety of adapted toys. The size of the switch is determined by the child's accuracy of reach.

Construction is very simple. A table saw is a requirement. The 1/2" and the 3/8" plywood should have few or no voids between the plies. The operating panel is clear polycarbonate plastic (Lexan or equivalent) that has been spray-painted a bright color on the underside after the holes have been drilled. The plywood is cut to the width and length dimensions. The slot is cut in the top piece, the bottom screws are put in place, and the front and side 45-degree angle cuts are made. Sanding overall should be followed with two coats of Varathane varnish or equivalent. Disassemble and do the wiring. Reassemble and install the operating panel on top and the non-skid material or rubber pads on the bottom.



Use clear polycarbonate plastic that is 1/8" (.125") thick. It is obtainable from companies that sell glass or any plastic supply house. One is U.S. Plastic Co. in Lima, Ohio. You may order by phone: 1-800-537-9724. Ask for stock no. 43020 in whatever quantity you need at $3.33 (1983) per square foot plus UPS charges.

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SMALL PLATE SWITCH

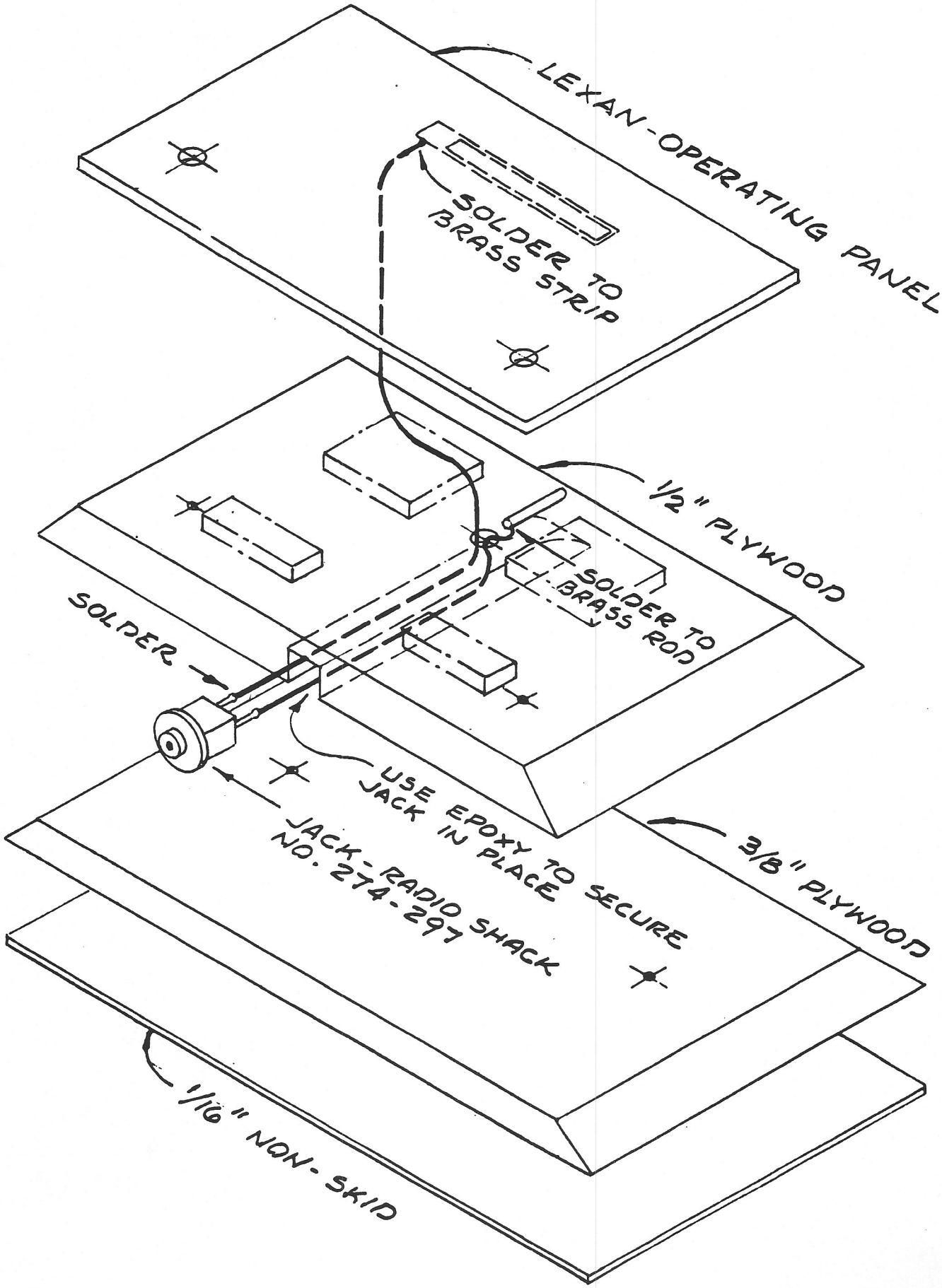
Materials needed:

- Birch plywood: 6½" x 3-3/4" x 1/2"
- Birch plywood: 6½" x 3-3/4" x 3/8"
- Clear Lexan: 3" x 5" x 1/8"
- 2 flat-head Phillips screws: 3/4" x #6
- Brass rod: 1/16" diameter x 7/8"
- Shim stock: 1-1/4" long x 1/4" wide
- Vinyl foam: 1" x 1/4" wide x 1/16" thick
- Vinyl foam: 2" x 2" x 1/4" thick, cut into pieces as shown on drawings
- Jack: Radio Shack #274-297
- Rosin core solder
- #20 gauge wire: Radio Shack #278-1307
- Epoxy glue
- Elmer's Carpenter Glue
- Varathane or equivalent gloss varnish
- Varathane or equivalent enamel in bright colors
- Non-skid material or felt: 6½" x 3-3/4"; this provides a protective bottom surface

Tools needed:

- Table saw
- Sander
- Electric drill and set of drill bits
- Ruler
- Square
- Screwdriver
- Brush

SMALL PLATE SWITCH



WIRING SCHEME

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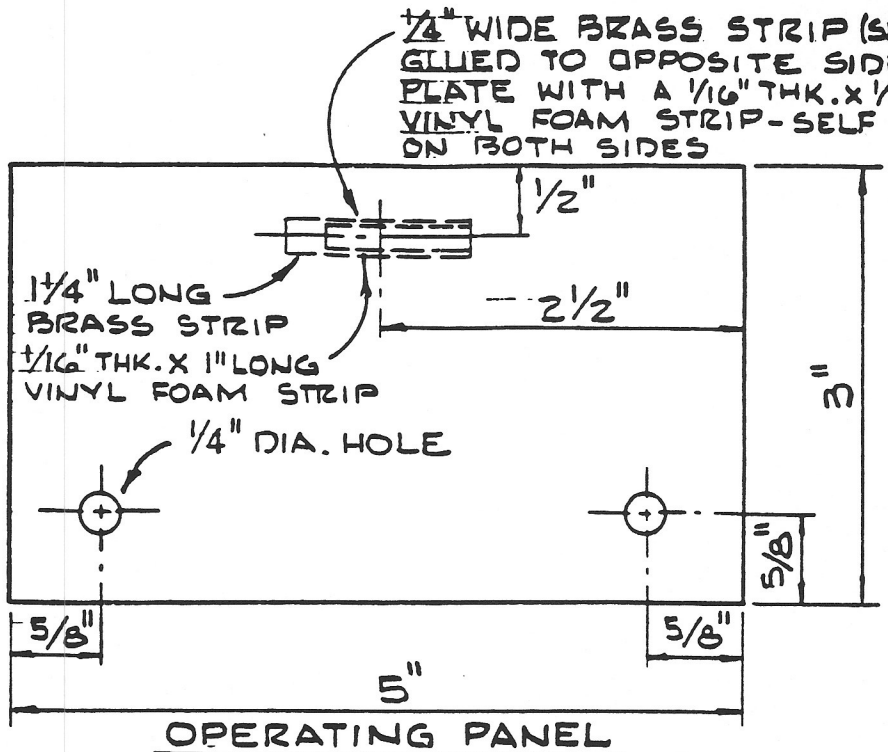
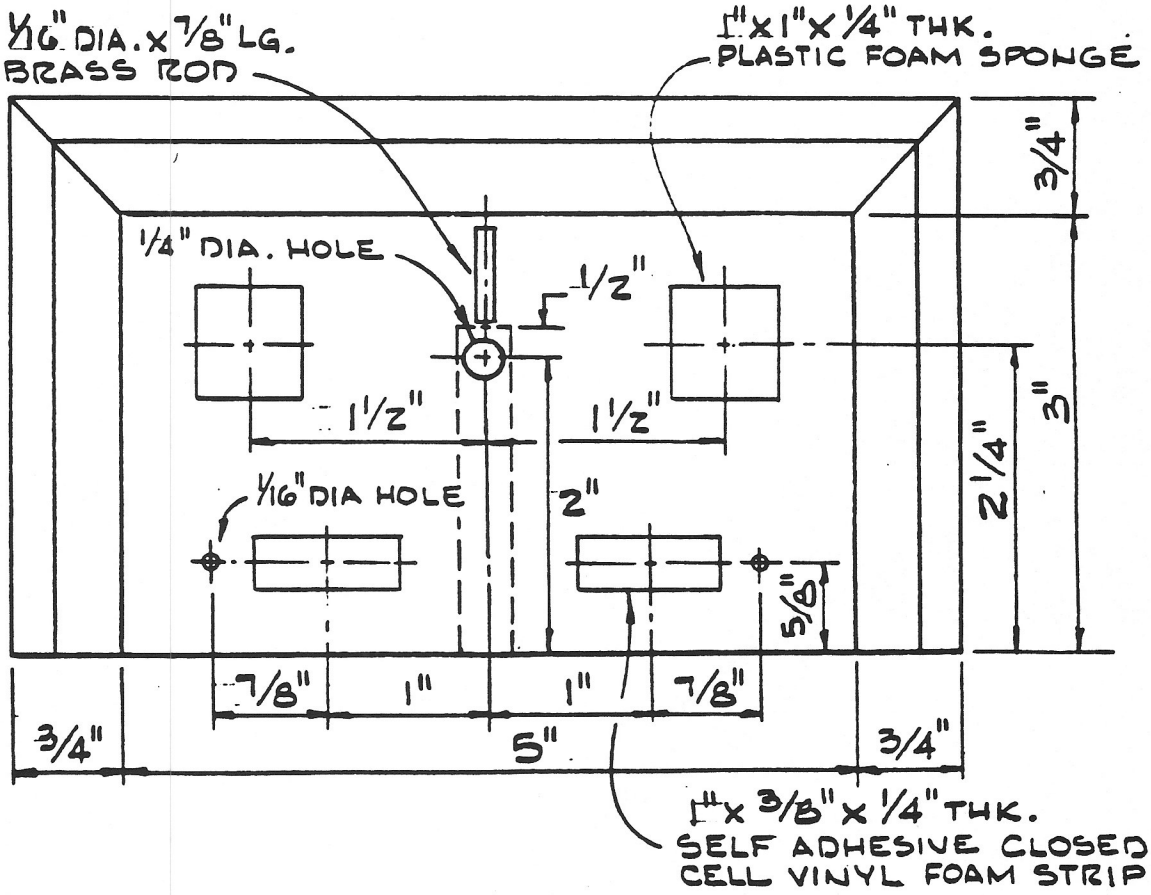
SMALL PLATE SWITCH


1/4" WIDE BRASS STRIP (SHIM STOCK) GLUED TO OPPOSITE SIDE OF PLATE WITH A 1/16" THK. x 1/4" WIDE VINYL FOAM STRIP - SELF ADHESIVE ON BOTH SIDES
1/2"
1 1/4" LONG BRASS STRIP
1/16" THK. X 1" LONG VINYL FOAM STRIP
2 1/2"
3"
1/4" DIA. HOLE
5/8"
5/8"
5/8"
5"

OPERATING PANEL

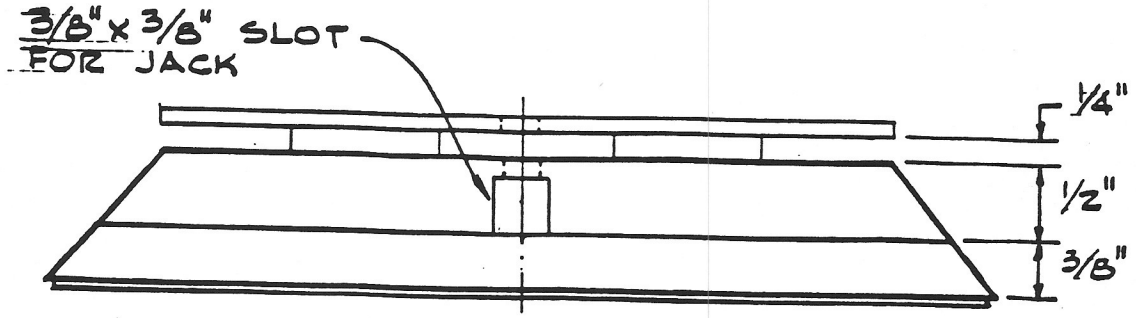
1/8" THICK CLEAR LEXAN - SPRAY PAINTED



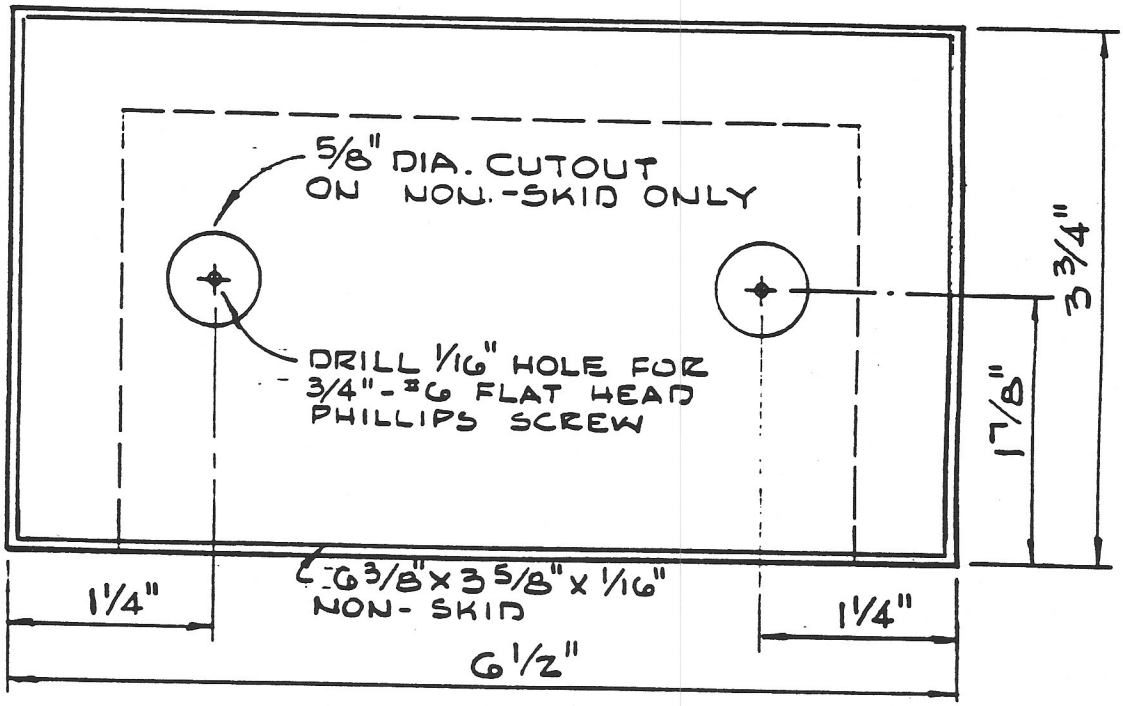
TOP VIEW OF SWITCH BOX
SHOWN WITHOUT LEXAN PANEL

(c) 1987 THE NATIONAL LEKOTEK CENTER

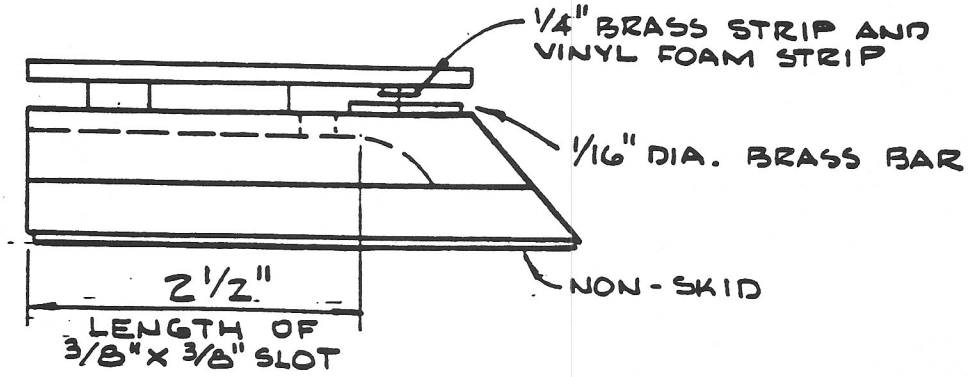
SMALL PLATE SWITCH



END VIEW OF SWITCH BOX



BOTTOM VIEW OF SWITCH BOX



SIDE VIEW OF SWITCH BOX

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